

# **Results of a Survey of CNMI and Guam Residents on the Marianas Trench Marine National Monument<sup>1</sup>**

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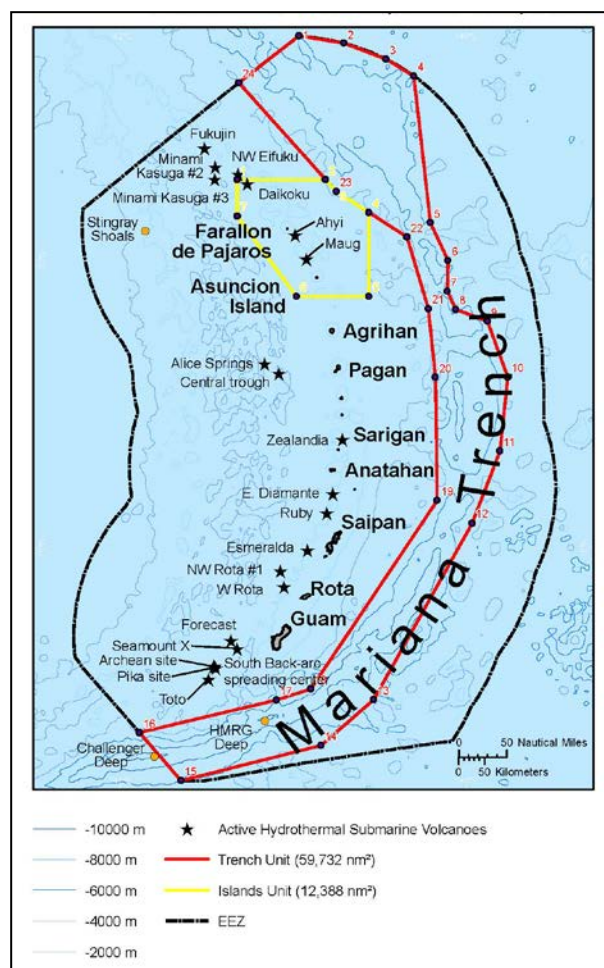
# Results of a Survey of CNMI and Guam Residents on the Marianas Trench Marine National Monument

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## Introduction

In January 2009, President George W. Bush established the Marianas Trench Marine National Monument (Monument) by Presidential Proclamation 8335. The Monument encompasses approximately 95,216 square miles of area divided into three units within the 200-nm Exclusive Economic Zone around Guam and the Commonwealth of the Northern Mariana Islands (CNMI); the

**Figure 1. Features and boundaries of the Marianas Trench Marine National Monument.**



islands of these two U.S.-affiliated entities comprise the Mariana Archipelago. The Monument's *Trench Unit*, almost 1,100 miles long and 44 miles wide, extends along the length of the archipelago and includes only the submerged lands. The *Volcanic Unit* consists only of the submerged lands within 1 nm of 21 active undersea mud volcanoes and thermal vents scattered along the Mariana Arc. The *Islands Unit* includes both the waters and submerged lands below the mean water line within the unit boundaries around the three northernmost Mariana Islands: Farallon de Pajaros (also known as Uracas); Maug; and Asuncion. Within the Islands Unit of the monument commercial fishing is prohibited but sustenance, recreational, and traditional indigenous fishing can be allowed on a sustainable basis (Proclamation 8335, 2009).

The Secretary of the Department of the Interior (through the U.S. Fish and Wildlife Service) in consultation with Secretary of the Department of Commerce (through the National Oceanic and Atmospheric Administration) is responsible for management of the Monument in cooperation with the Department of Defense, U.S. Coast Guard, and the Government of the Commonwealth of the Northern Mariana Islands (Proclamation 8335, 2009).

A subsequent Secretary of the Interior action on January 16, 2009, delegated management responsibilities for the Monument to the Fish and Wildlife Service and placed two of the units (the Mariana Trench and Volcanic Units) within the National Wildlife Refuge System as the Mariana Trench and Mariana Arc of Fire National Wildlife Refuges (Secretary Order 3284, 2009).

To help guide development of a Monument Management Plan, Monument managers solicited comments from residents of CNMI and Guam at public scoping meetings in 2012. Participants provided comments on a wide range of issues and topics related to management of the Monument, including a proposed visitor center, a research program, ecosystem management, education and outreach, monitoring and enforcement, ancestral ties to the Monument, vessel groundings, climate change, and fishing.

In addition to these public meetings, management activities as described in the proclamation will include:

- public education programs and public outreach regarding the coral reef ecosystem and related marine resources, and species of the monument and efforts to conserve them;
- traditional access by indigenous persons for culturally significant subsistence, cultural, and religious uses within the monument;
- a program to assess and promote monument-related scientific exploration and research, tourism, recreation, and economic activities and opportunities in the CNMI;
- a process to consider requests for recreational fishing permits in certain areas of the Islands Unit, based on an analysis of the likely effects of such fishing on the marine ecosystems of these areas, sound professional judgment that such fishing will not materially interfere with or detract from the fulfillment of the purposes of this proclamation, and the extent to which such recreational fishing shall be managed as a sustainable activity;
- and programs for monitoring and enforcement necessary to ensure that scientific exploration and research, tourism, and recreational and commercial activities do not degrade the monument's coral reef ecosystem or related marine resources or species or diminish the Monument's natural character.

With funding from the NOAA Fisheries Pacific Islands Regional Office, the Human Dimensions Research Program (HDRP) at the NOAA Fisheries Pacific Islands Fisheries Science Center conducted a survey of randomly selected residents of CNMI and Guam to provide information for a management plan for the Monument. Designation of the Monument was accompanied by social debate over the merits of designation, the potential economic benefits, increased federal management in the archipelago, the impacts to fishermen and fishing communities, and other effects (Kotowicz and Richmond, 2013). Now that the Monument has been established and management planning is ongoing, Monument managers believe there is a need for research to define CNMI and Guam residents' management preferences and their perceptions of Monument effects so this information is available to managers as they develop and begin to implement the plan.

## **Methodology**

Following an open solicitation process, HDRP hired an established polling firm, American Directions Group, Inc., located in Lakeland, Florida to conduct the telephone survey and the survey was conducted in January and February, 2012. The following section describes survey procedures. The HDRP survey was conducted by telephone from January 9 through February 12, 2012. The sample was designed for a total of 1,000 respondents selected using random digit dialing (RDD) phone interviews, with 500 randomly selected Guam residents and 500 randomly selected CNMI residents. In addition, 200 of the 1,000

interviews were initiated as cell phone calls to include residents who were more likely to be reached by cell phone<sup>2</sup>.

**Table 1. Sampling and call mode of CNMI monument survey**

<b>Location</b>	<b>Call Mode</b>		
	<b>Total</b>	<b>Landline</b>	<b>Cell Phone</b>
Guam	500	400	100
CNMI	500	400	100
<b>Total</b>	<b>1,000</b>	<b>800</b>	<b>200</b>

RDD and computer assisted telephone interviewing methodologies were used for conducting both landline and cell phone interviews. One problem with the RDD approach that affects the response rate for a survey is that potentially a large number of business, institutional, and other, non-residential phone numbers are contacted, as well as non-working, disconnected residential phone numbers; these are all classified as called unknown contact outcomes. When considering completed surveys divided by the number of attempted interviews (not including unknown contact outcomes), the response rate was 50%. The overall response rate to the survey was 38%. This represents the proportion of completed surveys from the total number of attempted interviews including all calls placed to households. Considering this survey was a RDD phone interview, this is a reasonable response rate.

All estimates provided from the survey are within +/- 4.2% of population values at the 95% confidence level. For example, if 52% of the respondents reported a particular attitude toward the Monument, then we can be 95% confident that between 47.8% and 56.2% of the entire population has the same attitude. Precision of the sample estimates was dependent partly on underlying variability in population characteristics and partly on sample size, which in turn was dictated by sampling costs and the desired margin of error.

The survey was pretested with 9 Guam/CNMI respondents and each interview was audiotaped. The results of the pretest were used to revise survey questions and interviewer instructions before the final survey effort began. Fifty-two interviewers and supervisors were trained for survey implementation. All interviewers received a full project briefing, which covered a project overview, purpose of research, target respondents (with a map showing general area of the Monument), privacy laws, Guam/CNMI general population information, and what to expect from respondents. Interviewers were also briefed on the survey, and a formal review of each question was conducted that addressed any potential issues, pronunciations of names and coding of responses (for further discussion, see section on Limitations of the Study).

Interviews were conducted in English when possible. As needed, translation services were provided for respondents speaking Chamorro and Tagalog, the most prevalent non-English languages in Guam and CNMI. Other Asian-speaking respondents (126, after sample adjustment) were encountered, including those speaking Korean, Vietnamese, and Chinese. When possible, an English-speaker in these households was interviewed; otherwise, the interview was not conducted. This introduces a slight bias due to the lack of language capabilities.<sup>3</sup>

<sup>2</sup> Reflecting cell phone-only and –mostly respondents.

<sup>3</sup> For further discussion see Limitations of the Study

Supervisors monitored the survey and ensured quality control by listening to selected interviewers at work and holding regular discussions with the interviewers about problems and issues that could impact data quality, respondent refusal rates and the length of time for interviews. Data were reviewed after completion of 25, 100, 250 interviews and after the final dataset of 1000 interviews was compiled. The purpose of the data monitoring was to fine tune the interviewer-respondent dialog and ensure accurate and complete data were collected.

The survey contained questions on awareness, knowledge, and attitudes of residents regarding the Monument; preferences for management and scientific research; and levels of interest in becoming involved in Monument management and outreach activities. Additional questions included experiences with and attitudes toward current uses of coastal and marine resources, to provide a context for interpreting responses regarding the Monument. The entire raw dataset was submitted by the contractor to HDRP for data analysis.

In the sections below, we describe key findings, discuss demographics and other characteristics of interviewees, and summarize responses to individual survey questions on a range of topics. Appendix A contains details about sample design and survey administration; Appendix B contains the questionnaire.

## **Key findings**

- People from CNMI were more likely than people from Guam to have heard about the Monument, although substantial proportions of both said they had not heard about the Monument until receiving the survey.
- Of those who said they had been aware of the Monument, over half from each area (Guam and CNMI) reported having little or no information about it. The mass media (radio, television, newspaper) was the most common way they had gotten information about the Monument.
- Very few of the respondents had visited one of three islands that are now included in the Islands Unit of the Monument (Uracas, Maug, Asuncion), but about half of the CNMI residents and a quarter of the Guam residents said they knew someone who had visited one or more of the islands.
- Of those who said they had heard of the Monument, a majority from both Guam and CNMI said they did not believe an adequate attempt had been made to understand and include the views of Guam and CNMI residents regarding the Monument's designation.
- CNMI residents were far more likely than Guam residents to have participated in activities associated with Monument designation or planning, mostly by discussing it with other people or reading about it.
- Of those who had heard about the Monument, more people supported designation than opposed it, although a substantial proportion were neutral. After receiving some background information about the Monument – its location, activities to be managed within it, and the government entities jointly managing it – respondents were again asked their attitude toward

the Monument, and support increased while neutrality and opposition decreased among both Guam and CNMI residents.

- Residents of both Guam and CNMI tended to believe that the Monument would have a range of positive economic effects. A majority did not believe that their households would be directly affected; of those who thought their household could be affected, more people thought the effects would be positive than negative, although many thought there could be both positive and negative effects.
- The residents supported a broad range of activities within the Monument such as charter/private boat recreational fishing, fishing for food while in the Monument, traditional indigenous fishing, cultural and religious uses other than fishing, tourism, scientific research, and monitoring and enforcement. More Guam residents supported military activities within the Monument than opposed them, while more CNMI residents opposed military activities than supported them.
- The residents strongly supported a wide range of research activities within the Monument, such as protected species, fish populations, and coral reef diversity, as well as the dissemination of research results within the schools and broader community.
- People wanted to be kept informed about Monument planning and management activities, through a variety of methods. The most popular methods were radio, TV and newspaper.
- Guam and CNMI residents had similar perceptions of the condition of reefs and associated fish populations around their respective island areas, with the highest proportions rating conditions as good or neutral; both groups rated the condition of farther offshore, open ocean waters and fish populations higher.
- Almost 40% of respondents from Guam and CNMI reported that they were not familiar with existing nearshore marine protected areas in their jurisdiction. They viewed MPAs in general as having positive effects although almost half of the sample from Guam and CNMI felt that MPAs can reduce access to traditional fishing.
- CNMI residents were most likely to say there were no existing conflicts over uses of the ocean and coast around their jurisdiction, while Guam residents were divided between perceiving no conflict and moderate levels of conflict. About the same proportion of each group said there was lots of conflict as said there was little conflict. Residents supported coastal and marine spatial planning efforts to reduce conflicts.
- Guam and CNMI residents had similar perceptions of what constituted commercial fishing, with the highest proportion saying that it's a commercial fishing trip if the fish are sold for profit or if any fish caught on the trip are sold. A lower proportion said that bartering or trading fish, or selling fish to pay expenses, would constitute a commercial fishing trip, but a majority of both Guam and CNMI residents still believed this would be a commercial trip. A majority felt that a trip in which fish caught on the trip were shared with the community would mean the trip was not commercial.

- A little over a third of the sample reported that they or someone else in their household was a fisherman and provided information such as their household's orientation to fishing including the number of boat-based and shore-based trips taken over the past year. Respondents from Guam and CNMI fishing households were more likely to be polarized regarding their current attitude toward the Monument; higher proportions were strongly opposed and strongly supportive of the Monument compared to non-fishing households, which had greater proportions of respondents who reported being neutral. Respondents from fishing households answered many questions similarly to respondents from non-fishing households but there were some important differences which are highlighted in the report.
- Demographic characteristics (income, education, age, gender) of the sample of 500 residents of Guam and 500 residents of CNMI were generally similar to the demographic characteristics of the Guam and CNMI populations as measured by the 2010 Census.

### **Fishing Households in Survey Sample**

Although the goal of this survey was to assess a sample of the general populations of CNMI and Guam, designation of Monument waters in fishing grounds and associated regulations on fishing are especially important for fishing households. Therefore, in the analyses below, any differences in responses by fishing and non-fishing households are identified.

Thirty-five percent of the Guam sample and 37% of the CNMI sample said they or someone else in their household was a fisherman. Thirty percent of the Guam and 24% of the CNMI respondents said they were the only fisherman in the household, about 40% from each said the fisherman was another member of the household, and 29% of the Guam and 37% of the CNMI respondents said they and one or more other household members were fishermen. This means that the actual sample of respondents included 103 Guam respondents who reported being fishermen on Guam (21% of the Guam sample) and 112 CNMI respondents who reported being fishermen (22% of the CNMI sample).

Respondents from fishing households in CNMI tended to be younger than respondents from CNMI non-fishing households, and respondents from fishing households in both jurisdictions tended to have lower education levels, with about half as many graduating from college. More than twice as many respondents from CNMI fishing households reported being unemployed (20%) compared to respondents from non-fishing households (9%); the proportion of unemployed respondents from Guam fishing households (17%) was also higher than the rate for non-fishing households (10%). However, there was no clear difference in the level of household income between fishing and non-fishing households in either jurisdiction.

Respondents from fishing households tended to be less likely to say they were neutral or not have an opinion on a variety of questions, compared to respondents from non-fishing households. They were also more likely to use the extreme ends of the five-point scales—for example, to “strongly oppose” or “strongly support” an activity rather than “support” or “oppose” it, even if the direction of their attitudes was the same as that of respondents from non-fishing households. This suggests that respondents from fishing households held stronger opinions on many issues than did respondents from non-fishing households.



## Responses to Survey Questions

Survey questions probed a wide range of topics with the aim of understanding residents' views about the new Monument. Interviewees were asked how they learned about the Monument, their impressions of its impact, their level of support for potential activities within the Monument, and their likelihood of engaging in Monument planning, among other topics. Results were summarized and are presented for respondents in both Guam and CNMI. In addition, responses were further analyzed within 2 categories of respondents: those from households with at least one member who fished and those from non-fishing households. A Pearson's chi-square test was used to examine if responses were statistically significantly different ( $p < 0.05$ ) between fishing households and households that were not involved in fishing.



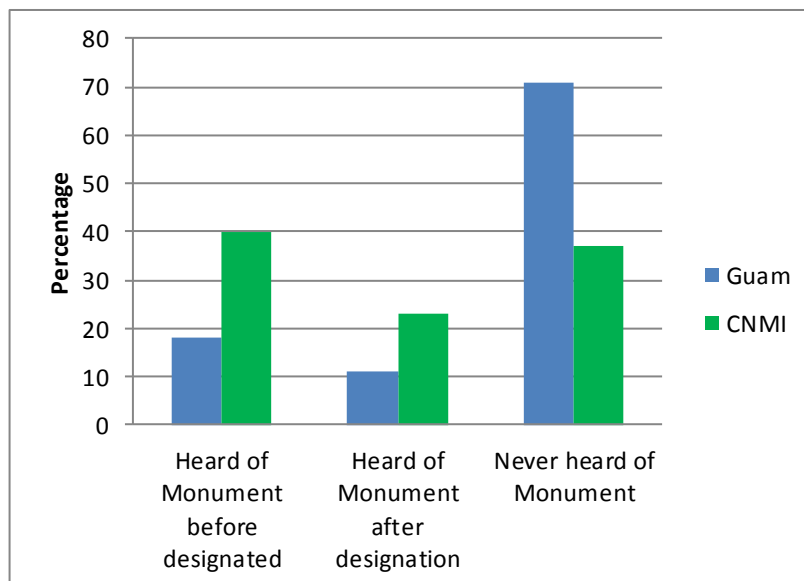
**When you see results below marked by a fish hook, it means that we found meaningful differences between fishing and non-fishing households.**

In a few places, we also compare results of this survey with findings of a related 2011 survey of 146 small-boat fishermen from Guam and 114 from CNMI (Hospital and Beavers, 2012; 2014)

### *Are people aware of the Monument?*

As would be expected, a higher percentage of CNMI residents said they had heard of the Monument compared with Guam residents. Forty percent of CNMI residents first heard of the Monument before it was designated and 23% after it was designated. Thirty-seven percent had never heard of it, so were learning about it for the first time through the survey. In contrast, just 18% of Guam residents heard about the Monument before it was designated, 11% after it was designated, and 71% had never heard of it.

**Figure 2. Distribution of respondents' awareness of the Monument**



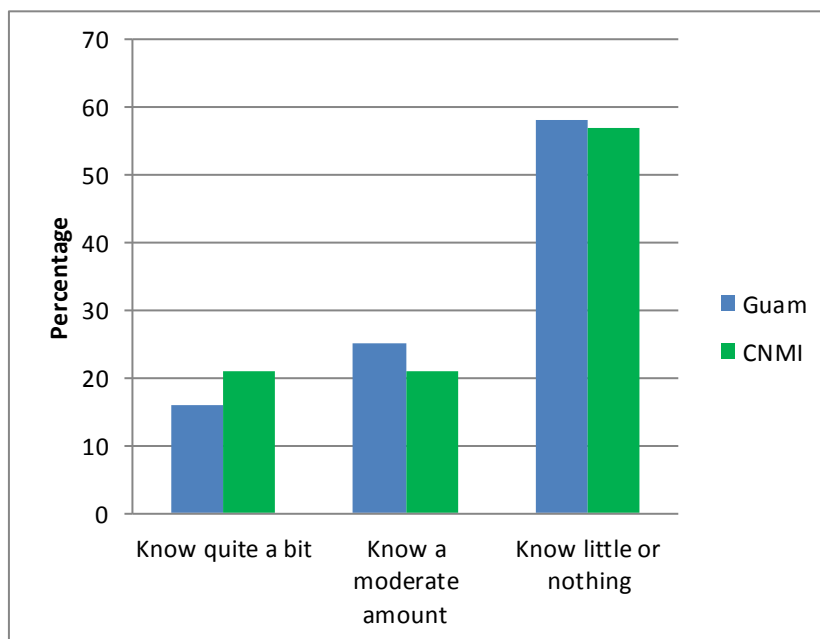
People who had visited one or more of the islands now comprising the Islands Unit, or who knew someone who had were more likely to have heard about the Monument before it was designated.

☞ Fishing households on Guam were more likely to have heard about the Monument before or after designation; the same tendency was found among CNMI fishing households, but not at a statistically significant level.

### *How much do people know about the Monument and where do they get their information?*

Of those respondents who said they had heard about the Monument before the survey, CNMI and Guam residents appeared to have comparable levels of knowledge about it.

**Figure 3. Distribution of respondents' level of knowledge of Monument**



☞ In Guam, fishing households were more likely to report they were knowledgeable about the Monument than were respondents from non-fishing households, a difference not found for CNMI residents.

Guam and CNMI small boat fishermen surveyed in 2011 by Hospital and Beavers (2012; 2014) reported relatively high levels of familiarity with the Monument: in that study 27% of Guam fishermen and 22% of CNMI fishermen said they were extremely familiar with the Monument, 64% from Guam and 71% from CNMI said they were somewhat familiar with the Monument, and less than 10% from each area said they had never heard of it.

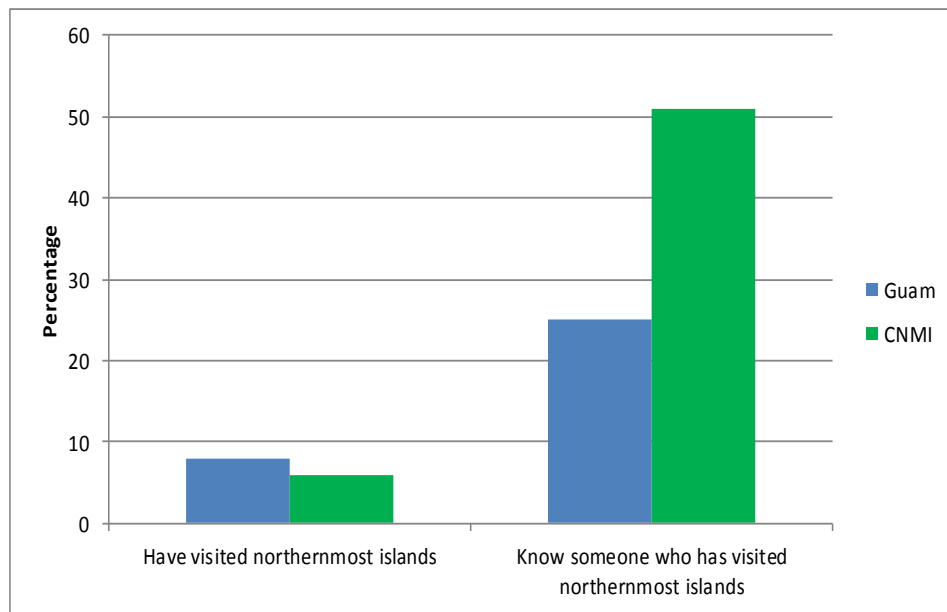
If survey respondents had heard about the Monument, they also were asked to list the way or ways they had heard about it. The most common ways in which survey respondents from both Guam and CNMI learned about the Monument were from radio, TV or newspapers followed by learning about it through friends and/or family.

**Table 2. Distribution of way in which respondents learned about the Monument**

<b>How first heard about Monument:</b>	<b>Guam residents</b>		<b>CNMI residents</b>	
	<b>Count</b>	<b>Percent</b>	<b>Count</b>	<b>Percent</b>
Radio, TV or newspaper	86	52	214	57
Friends/family	27	17	44	12
Meeting	2	1	13	4
Friends of Monument	6	4	31	8
Internet	6	4	10	3
Government Official	9	6	22	6
Other source	28	17	34	9
<b>Total</b>	<b>164</b>	<b>100</b>	<b>376</b>	<b>100</b>

Some respondents' knowledge about the Monument, or at least the three northernmost islands, may have come from their personal experience or conversations with others who had personal experience. Comparable proportions of both samples (CNMI and Guam) said they had visited one of three islands that are now included in the Islands Unit (Uracas, Maug, Asuncion), but about twice as many CNMI residents (51%) said they knew someone of someone else such as a friend or relative who had been to the northernmost islands than did Guam residents (25%).

**Figure 4. Distribution of respondents that visited the northernmost islands or knew someone who did**



Respondents from fishing households in both Guam and CNMI were more likely to say they had visited Uracas, Maug or Asuncion (14% Guam, 10% CNMI) than were respondents from non-fishing households (5% Guam, 5% CNMI). They were also more likely to report knowing someone else who had visited one or more of the three islands (39% Guam, 65% CNMI) than were non-fishing households (17% Guam, 42% CNMI).

CNMI residents were far more likely to have participated in past activities associated with Monument designation or planning, mostly by discussing it with other people or reading about it:

**Table 3. Distribution of interest in participation in types of Monument activities**

Participation in Monument activities:	Guam residents		CNMI residents	
	Count	Percent	Count	Percent
Attended Meeting	8	9	39	15
Wrote letter	2	2	10	4
Member of advocacy group	4	5	9	4
Read about it	23	27	65	25
Discussed it	42	49	10	41
Other	6	7	28	11
<b>Total</b>	<b>85</b>	<b>100</b>	<b>256</b>	<b>100</b>

If they had heard of the Monument, respondents also were asked if they believed there was an adequate attempt to understand and include the views of Guam and CNMI residents regarding the

Monument designation. Thirty-nine percent of the Guam residents and 47% of CNMI residents said yes, while 61% of Guam residents and 53% of CNMI residents said no.

🌀 Respondents from CNMI fishing households tended to believe that there was not an adequate attempt to incorporate resident views, but the difference between fishing and non-fishing households on this question was not statistically significant. Likewise, no such distinction was found on Guam.

### *What are people's attitudes toward the Monument?*

Of the Guam and CNMI respondents who had heard of the Monument, slightly less than one-fifth of respondents from each place said they strongly supported the Monument when they first heard about it, and the most common response from residents of Guam and CNMI was that they supported it. For both CNMI and Guam, respondents who had heard of the Monument before this survey were least likely to strongly oppose it.

During the survey, respondents received information about the Monument including when it was designated, where it is located, what types of activities will be managed within it and what government entities will be involved in its management. When asked about their current attitude toward the Monument (near the end of the survey), a majority of CNMI residents said they strongly support the Monument and almost three quarters either strongly support or support it. Similarly, just less than half of Guam residents said they strongly support the Monument and just less than three quarters either strongly support or support it. Subsequent levels of support appeared to be higher than initial levels for both populations, whether from what was learned about the Monument in the intervening time, or simply from the issues and topics raised in the survey itself.

**Table 4. Level of support or opposition to Monument when they first heard about it and at the conclusion of the survey**

Attitudes toward Monument	Guam residents		CNMI residents	
	Attitude when first heard about it (%)	Current attitude (%)	Attitude when first heard about it (%)	Current attitude (%)
Strongly support	19	47	18	51
Support	34	25	31	20
Neutral	30	20	24	19
Oppose	9	3	12	2
Strongly oppose	2	4	5	6

People who knew either quite a bit or a moderate amount about the Monument tended to have an opinion, rather than be neutral, but did not fall on one side or the other (support or opposition).

🌀 Respondents from fishing households on CNMI were more likely than those from non-fishing households to oppose the Monument when they first heard about it; this distinction was not found on Guam.

🌀 Respondents from Guam and CNMI fishing households were more likely to be polarized regarding their current attitude toward the Monument; higher proportions were strongly opposed and strongly supportive of the Monument compared to non-fishing households, which had greater proportions of respondents who reported being neutral.

### *What effects do people anticipate will occur because of the Monument?*

Respondents were provided with some basic information about the Monument; that it was designated in 2009 and is made up of certain waters and submerged lands in the Northern Mariana Islands chain and the Marianas Trench. They were told that within the Monument, activities such as scientific research, fishing practices and access will be jointly managed by the Federal Government, including NOAA Fisheries and the Fish and Wildlife Service, and representatives from the Guam and CNMI Territorial Governments.

Respondents were then asked their perceptions of the likelihood that the Monument would provide various benefits to the local economy. Several items in the list of benefits were taken from statements made by advocacy groups during debate over the Monument.

The potential effect that the most survey respondents reported they think will probably or definitely occur from both Guam and CNMI is increased visits by research scientists (69% of Guam and 71% of CNMI respondents). Increased tourism even if the Monument is not visited is the effect that the highest percentage of respondents reported they believe will probably or definitely not occur (33% of Guam and 35% of CNMI respondents).

**Table 5. Level of perceptions of likelihood the Monument will provide types of benefits to the local economy**

<b>Potential effect of Monument:</b>	<b>Guam residents</b>		<b>CNMI residents</b>	
	<b>% state effect probably or definitely WILL occur</b>	<b>% state effect probably or definitely WILL NOT occur</b>	<b>% state effect probably or definitely WILL occur</b>	<b>% state effect probably or definitely WILL NOT occur</b>
More media coverage	52	20	58	16
Increased tourism due to interest in the Monument	51	24	59	22
Increased tourism even if Monument is not visited	37	33	40	35
Increased visits by research scientists	69	12	71	11
400 more local jobs	46	26	51	25
Economic benefits of \$10 million annually	42	29	48	23
Establishment of visitor center on Saipan	44	26	57	18

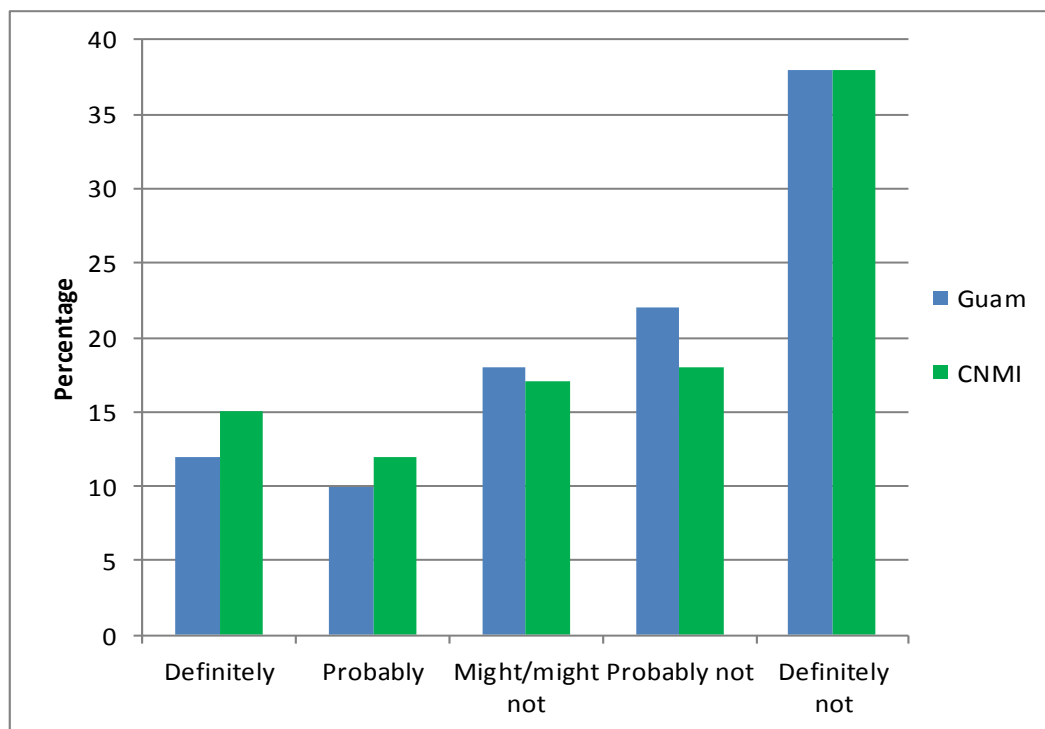
In a separate study by Hospital and Beavers (2012; 2014), small-boat fishermen surveyed in Guam and CNMI were asked if they thought the Monument would benefit the local economy. Twenty two percent from Guam and 24% from CNMI answered “yes”, 41% from Guam and 31% from CNMI answered “no”, and 38% from Guam and 45% from CNMI said they were not sure.

In our phone survey, respondents were also asked if they felt that the Monument will improve protection of marine resources in waters around the Marianas. Eighty-six percent of Guam residents and 89% of CNMI residents said “yes”, protection would improve.

Small boat fishermen surveyed in a separate study (Hospital and Beavers, 2012;2014) were asked if they thought the Monument would help to increase their catch rates. Sixteen percent from Guam and 12% from CNMI answered “yes”, 43% from Guam and 40% from CNMI answered “no”, and 42% from Guam and 48% from CNMI said they were not sure.

Respondents were asked about possible effects of the Monument on themselves and their households. Twenty-one percent of Guam residents thought that the Monument would have some effect on their households, while 59% thought it would not, and 18% believed they might or might not be affected. Similarly, 26% of CNMI residents thought that the Monument would have some effect on their households, while 54% thought it would not, and 17% believed they might or might not be affected.

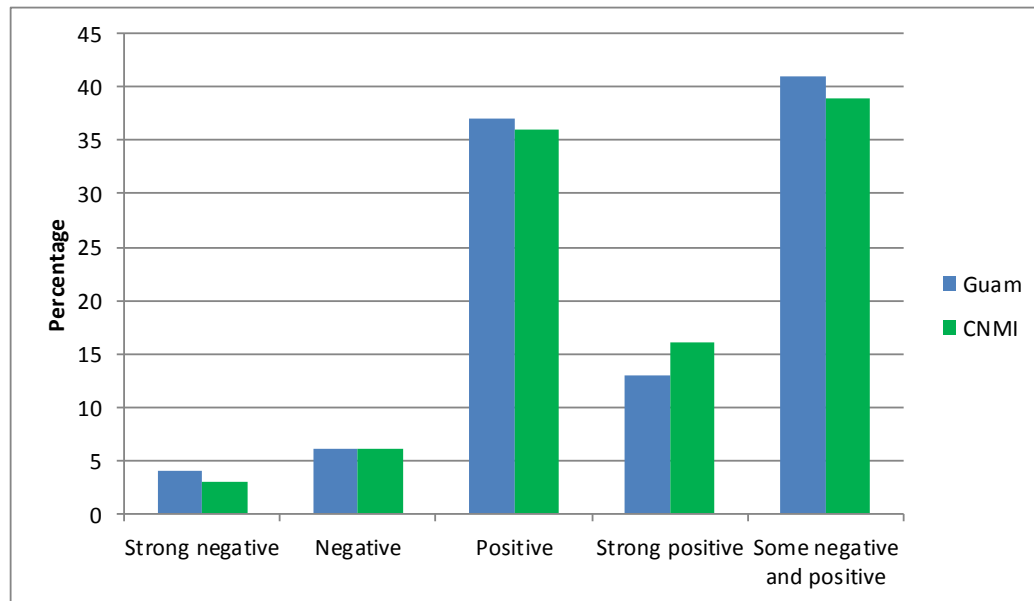
**Figure 5. Level of expectation that respondents' household will be affected by the Monument**



Respondents were asked what type of effect they expected on their households (people who said they definitely would not be affected were not asked the question). Respondents from both Guam and CNMI tended to think that the effects would be either positive or a mixture of positive and negative. Few

people expected the effects to be strong but of those who did, more thought they would be positive than negative.

**Figure 6. Type of effect anticipated due to Monument, for respondents that anticipated an effect**



There was no difference between fishing and non-fishing households in either jurisdiction regarding the likelihood that the Monument would affect their households or, if some effect was anticipated, whether it would be positive, negative, or both.

### *What activities do people support in the Monument?*

Respondents were informed that their input would be used to develop a management plan, and asked about their level of support for or opposition to various potential activities within the Monument. Guam and CNMI residents had similar patterns of responses, with strongest support for scientific research and tourism, and lowest support for military activities.



**Table 6. Distribution of level of support of opposition for allowing activities in the Monument**

Activity:	Guam residents		CNMI residents	
	% who support or strongly support	% who oppose or strongly oppose	% who support or strongly support	% who oppose or strongly oppose
Charter/private boat recreational fishing	56	21	53	23
Fishing for food while in the Monument	57	23	56	24
Traditional indigenous fishing	64	18	61	18
Tourism	71	10	79	11
Scientific Research	83	7	82	6
Cultural and religious uses other than fishing	59	17	57	16
Monitoring and enforcement	71	10	69	12
Military activities	46	28	36	41

🌀 Respondents from fishing households were more likely to strongly support fishing for food and traditional indigenous fishing in the Monument than were respondents from non-fishing households. Respondents from Guam fishing households were more likely than those from non-fishing households to strongly support charter and recreational fishing in the Monument, but this difference was not found for CNMI respondents. Respondents from Guam fishing households were also more likely than those from non-fishing households to strongly support cultural and religious uses other than fishing, and to strongly support monitoring and enforcement in the Monument. Respondents from CNMI fishing households were less likely to support military activities in the Monument than were respondents from non-fishing households.

Respondents were informed that permits could be required for some types of public use activities within the Monument, and asked whether they thought that the permit process should be more restrictive, to err on the side of resource protection, or less restrictive, to err on the side of resource use. Regardless of their place of residence, 64% of respondents thought permits should be more restrictive, and 36% thought the process should be less restrictive.

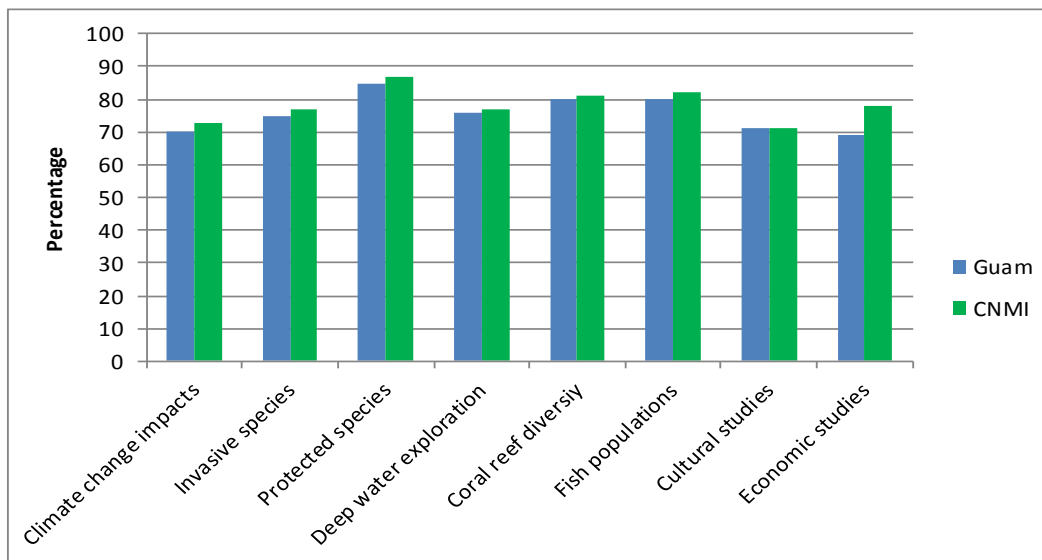
🌀 A majority of both fishing and non-fishing households believed that public use permits should be more restrictive and err on the side of resource protection than should be less restrictive to err on the side of resource use. However, a lower proportion of respondents from Guam fishing households felt this way.

### *What kind of scientific research do people support in the Monument?*

The survey also informed people that the Monument would provide opportunities for scientific research and study of the unique ecosystem components, and asked about people's level of interest in a number of possible research topics. There were few differences between Guam and CNMI residents, who were interested in research on the full range of topics. Another reflection of the high level of interest was

that uniformly across topics, about twice as many people were very interested than were interested, and of the remainder, most were neutral rather opposed to any particular topic.

**Figure 7. Distribution of respondents 'interested' or 'very interested' in types scientific research in the Monument**



In general, respondents from fishing households were more likely to say they were very interested in a full range of research topics associated with the Monument than were respondents from non-fishing households. This was especially true for the topics of fish populations, coral reef diversity, invasive species, and protected species. The differences between fishing and non-fishing households tended to be larger for Guam than CNMI respondents.

Given this level of interest it's not surprising that 97% of Guam and 95% of CNMI residents strongly supported having scientists present their Monument research results locally. Forty-nine percent of Guam residents and 63% of CNMI residents said they would be likely or very likely to attend presentations of scientists' results of studies in the Monument.

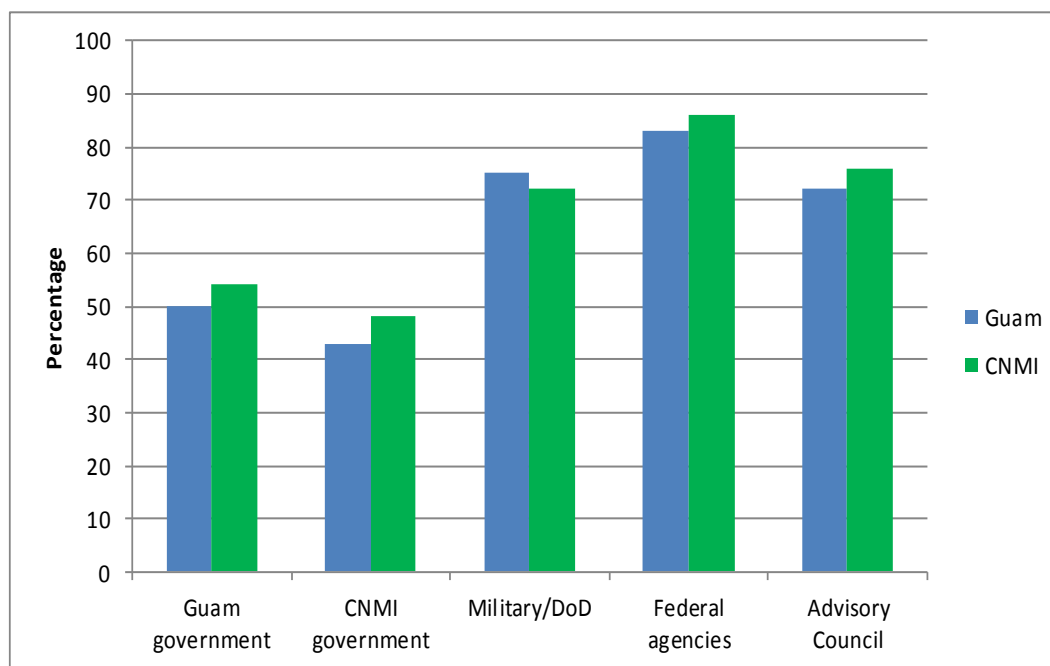
Ninety percent of Guam residents and 90% of CNMI residents said they support or strongly support using Monument science results to increase marine education in the schools. Fifty-eight percent of Guam residents and 71% of CNMI residents said they would be likely or very likely to volunteer to help visiting scientists with science education for local students, researchers, and educators.

Respondents from fishing households reported higher levels of anticipated interest in Monument science activities, such as attending scientists' presentations of their results, than respondents from non-fishing households.

### *How much confidence do people have in Monument managers?*

The administrators of the survey informed people that a number of government entities would be involved in management of the Monument, including NOAA Fisheries, the U.S. Fish and Wildlife Service, the governments of Guam and CNMI, an advisory council with federal and CNMI members, and the military/Department of Defense. People were asked whether they had no confidence, low confidence, moderate confidence, or high confidence in the ability of each entity to manage the Monument.

**Figure 8. Distribution of respondents with moderate or strong confidence in Monument**



Survey respondents from both Guam and CNMI most often reported moderate or strong confidence in federal agencies' ability to manage the Monument. Respondents from both Guam and CNMI rated the CNMI government with the lowest percentage of moderate or strong confidence in their ability to manage the Monument.

### *How would people like to be involved in Monument-related activities?*

Eighty-seven percent of CNMI residents and 77% of Guam residents said they would like to be updated on the status of the Monument activities and specified their preferred methods of being kept informed of Monument activities; these included public meetings, public schools, newsletters, Radio/TV and other media, including social media.

**Table 7. Preferred method of outreach about Monument activities**

<b>Preferred method of outreach:</b>	<b>Guam residents</b>		<b>CNMI residents</b>	
	<b>Count</b>	<b>Percent</b>	<b>Count</b>	<b>Percent</b>
Public meeting	156	11	217	14
Public school	169	12	211	13
Newsletter	201	15	233	15
Facebook/blog/web	242	17	269	17
Newspaper	282	20	320	20
Radio/TV	299	22	301	19
Other	42	3	23	2

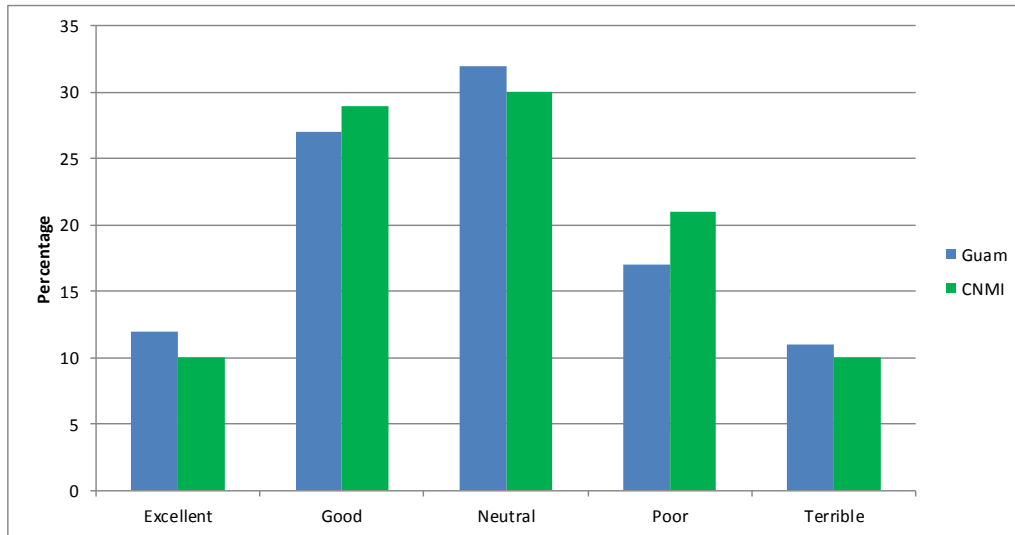
Forty-seven percent of Guam residents and 59% of CNMI residents said they would be likely or very likely to attend public meetings related to creating the management plan for the Monument. Forty-seven percent of Guam residents said they would likely or very likely visit a Monument Visitor Center on Guam, compared to 64% of CNMI residents who said they be likely or very likely to visit a Visitor Center located in CNMI.

🌀 Respondents from both Guam and CNMI fishing households were more likely to report wanting updates on the status of the management plan, and reported that they were more likely to be involved in a full range of Monument planning/management activities, such as attending public meetings on the management plan, or going to a Monument visitor center.

### *How do people perceive current conditions of the marine ecosystem and nearshore marine protected areas?*

Guam and CNMI residents had similar perceptions of the condition of reefs and associated fish populations around their respective island areas. In both areas, less than 40% rated the conditions as excellent or good and about 30% rated them as neutral. Twenty-eight percent of Guam residents rated conditions around Guam as poor or terrible, and 31% of CNMI residents rated conditions around CNMI as poor or terrible. Both groups rated the condition of open ocean waters and fish populations farther offshore higher, with only 18% of Guam residents and 20% of CNMI residents rating conditions there as poor or terrible.

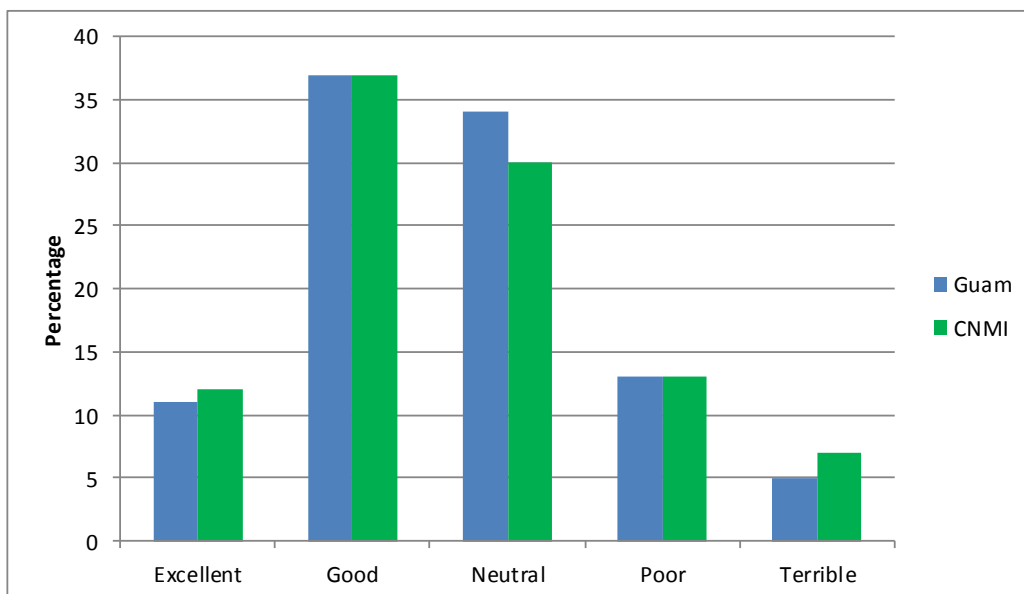
**Figure 9. Distribution of rating of condition of reef waters and fish populations**



🌀 Respondents from Guam and CNMI fishing households were more likely to rate reef water and fish populations around their jurisdiction as poor or terrible (35% Guam and 39% CNMI) compared to respondents from non-fishing households (24% Guam and 26% CNMI).

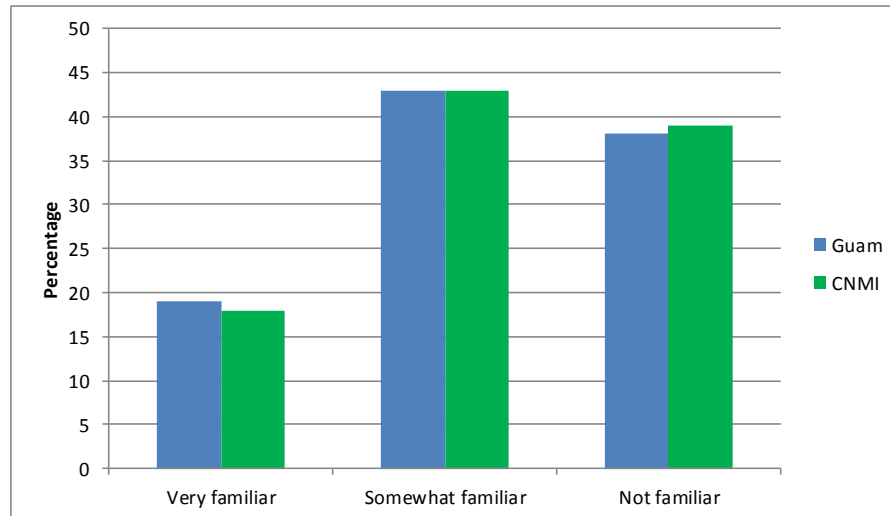
🌀 In Guam, respondents from fishing households were more likely to rate offshore, open ocean waters and fish populations around their jurisdiction as poor or terrible (24%) compared to respondents from non-fishing households (15%).

**Figure 10. Distribution of rating of condition of farther offshore, open ocean waters and fish populations**



Guam and CNMI residents had very similar levels of awareness of nearshore protected areas near their jurisdictions, with about 20% reporting being very familiar with these areas and 43% somewhat familiar.

**Figure 11. Distribution of level of familiarity with nearshore protected areas in their jurisdiction**



Respondents from Guam and CNMI fishing households were much more likely to report being very familiar with nearshore protected areas around their jurisdiction (37% in Guam and 27% in CNMI) compared to respondents from non-fishing households (10% in Guam and 12% in CNMI).

Seventy percent of Guam residents and 64% of CNMI residents said that designation of these areas did not change their use of coasts and waters, while 30% of Guam and 36% of CNMI residents said designation had changed how they used coasts and waters.

Respondents from Guam and CNMI fishing households were much more likely to report that their use of nearshore waters had changed after protected areas were designated (56% in Guam and 49% in CNMI) compared to respondents from non-fishing households (17% in Guam and 28% in CNMI).


Respondents were asked whether they agreed or disagreed with statements people have made about the effects or conditions of nearshore marine protected areas. The question wording was not specific to MPAs around Guam or CNMI.

People's self-reported level of familiarity with nearshore MPAs were related to these responses; respondents who reported being more familiar with nearshore MPAs tended to have more polarized opinions on the effects of them as reported in the table below.

**Table 8. Distribution of agreement or disagreement with statement about nearshore MPAs**

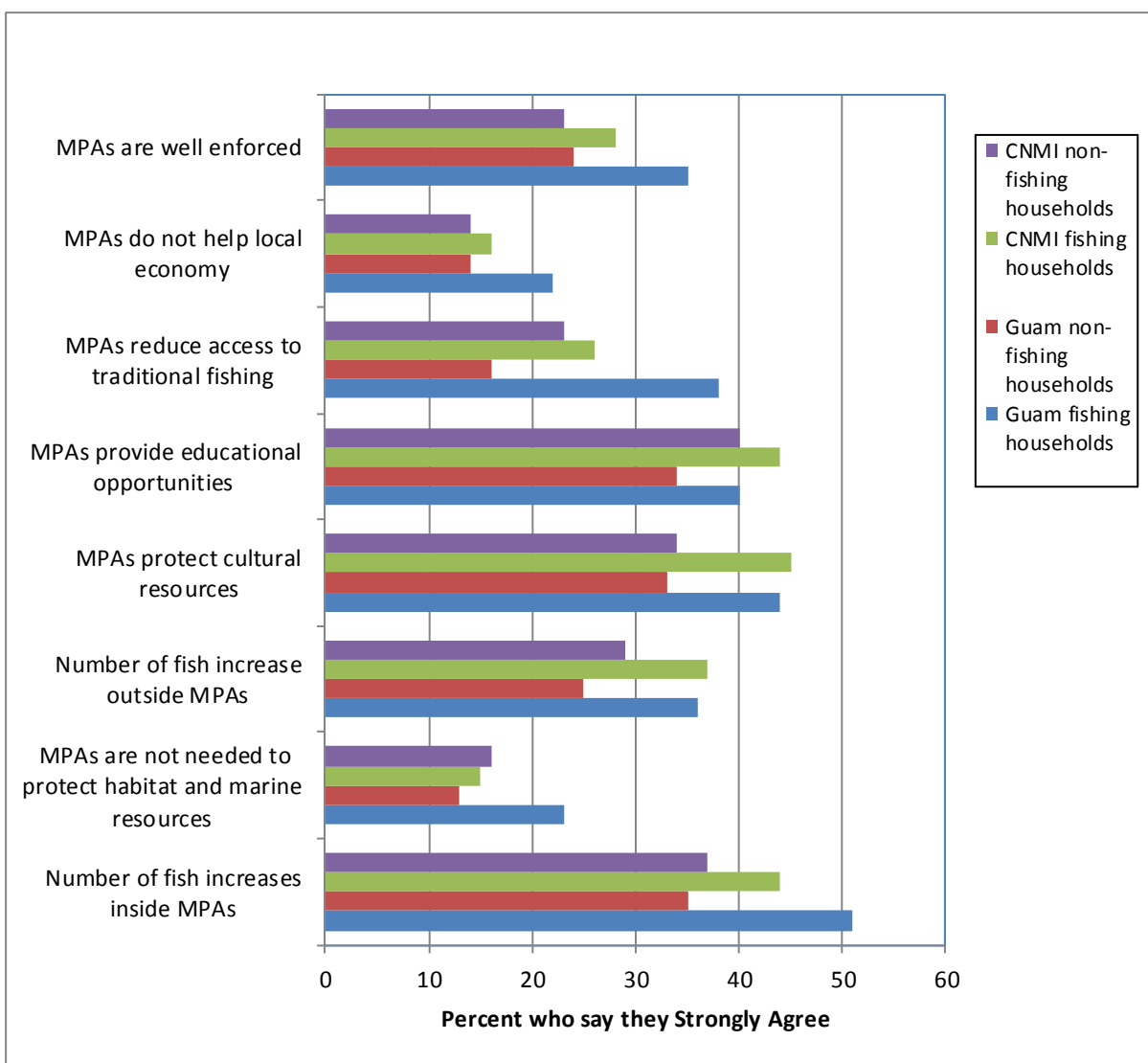
	Guam residents		CNMI residents	
	% who agree or strongly agree	% who disagree or strongly disagree	% who agree or strongly agree	% who disagree or strongly disagree
<b>Statement about nearshore MPA:</b>				
They increase the number of fish inside the preserve	68	9	67	12
They are not needed to protect habitats and marine resources	29	50	28	52
They increase the number of fish outside the preserve	56	14	58	14
They protect cultural resources	65	12	67	13
They provide educational opportunities	66	12	70	13
They reduce access to traditional fishing	47	24	46	24
They do not provide benefits to the local economy	31	40	30	43
They are well enforced	54	20	49	23

Regarding perceptions about the effects of nearshore marine protected areas, results varied by question and jurisdiction. In Guam, the highest percentage of respondents agreed or strongly agreed (68%) with the statement that nearshore MPAs increase the number of fish inside the preserve. The statement with the highest percentage of respondents in Guam that disagreed or strongly disagreed (50%) was that nearshore MPAs are not needed to protect habitats and marine resources. Respondents from CNMI most often agreed or strongly agreed (70%) that nearshore MPAs provide educational opportunities and they most often disagreed or strongly disagreed (52%) that nearshore MPAs are not needed to protect habitats and marine resources.

 Respondents from fishing households on Guam were much more likely than those from non-fishing households to strongly agree that nearshore MPAs reduce access to traditional fishing, but the same difference was not found among CNMI respondents. Respondents from fishing households in both Guam and CNMI were more likely than non-fishing households to strongly agree that the numbers of fish increase both inside and outside the MPA.

Small boat fishermen surveyed in a separate study (Hospital and Beavers, 2012;2014) were asked how effective MPAs have been in promoting sustainable nearshore fisheries in the Marianas. Twenty-six percent from Guam and 26% from CNMI answered “extremely effective”, 35% from Guam and 35% from CNMI said “somewhat effective”, 10% from Guam and 4% from CNMI said “somewhat ineffective”, and 9% from Guam and 7% from CNMI said “not effective at all.” Twenty-one percent from Guam and 29% from CNMI said they were neutral regarding the effects of MPAs on sustainable nearshore fisheries.

**Figure 12. Distribution of people who 'strongly agree' with several statements about MPAs**

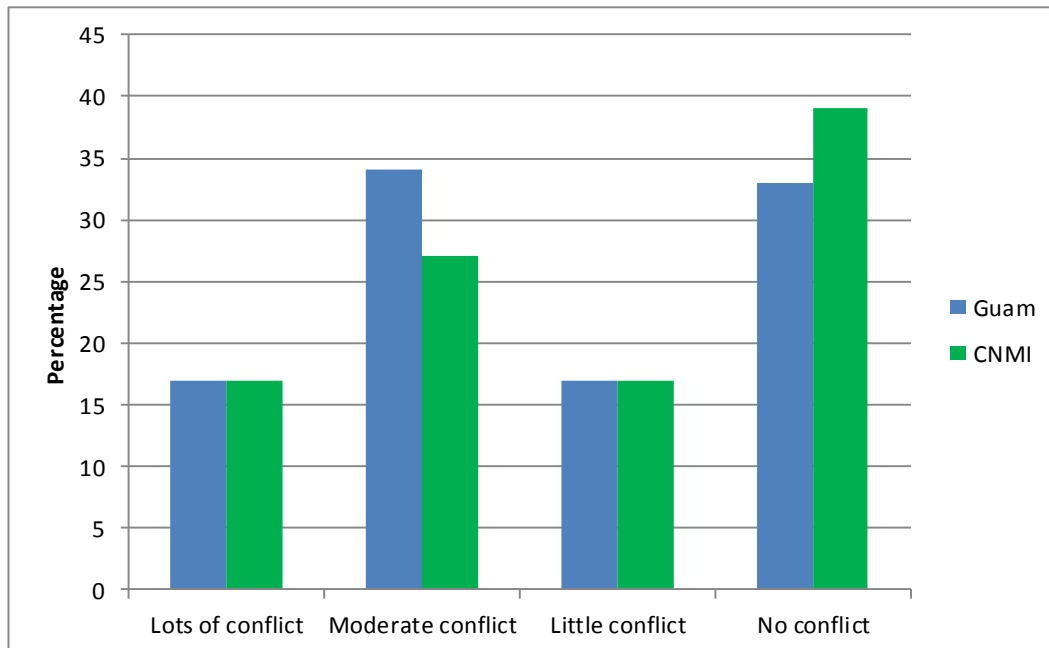


### *Do people perceive there are conflicts among coastal and ocean uses?*

When asked about their perceptions of conflict over uses of the ocean and coast around their area of residence (Guam or CNMI), CNMI respondents were most likely to say no conflicts currently exist, while Guam residents were divided between perceiving no conflict and moderate levels of conflict. About the same proportion of each sample said there was lots of conflict as said there was little conflict.



**Figure 13. Perceptions about level of conflict in ocean and coastal areas in their jurisdiction**

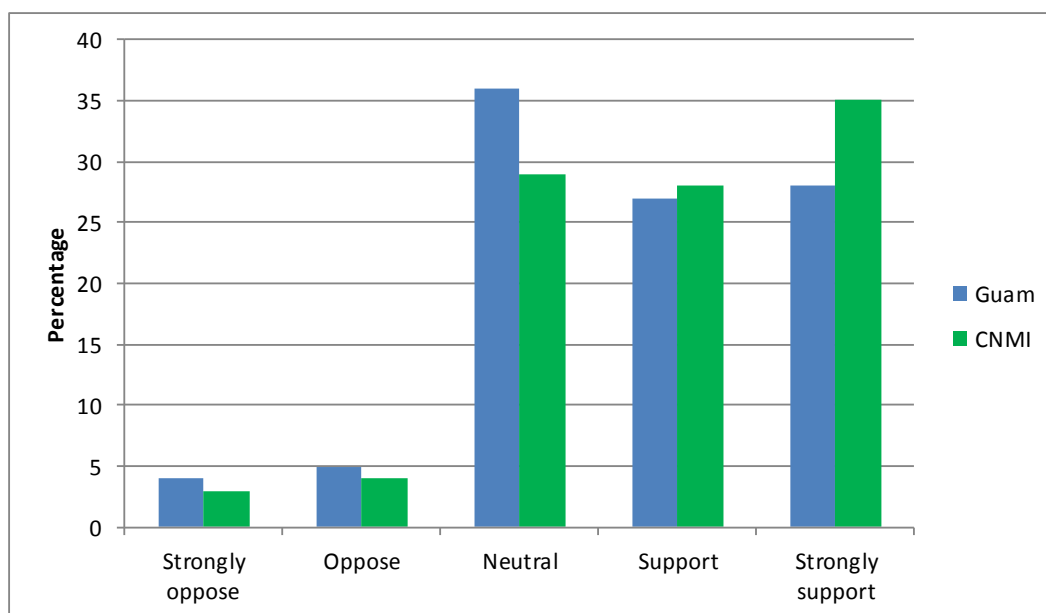


In both Guam and CNMI, respondents from fishing households were more likely to perceive conflict on the ocean and coast around their jurisdiction than were non-fishing households. Twenty-one percent of the respondents from fishing households on Guam and 30% from CNMI said there was no conflict, while 40% of the respondents from non-fishing households said there was no conflict around Guam and 45% said there were no conflicts around CNMI.

### *Do people support marine and coastal spatial planning?*

Respondents were informed about coastal and marine spatial planning, which was defined as designating zones for one or more uses to address user conflicts, and asked about their level of support for such planning. Far more residents of both areas supported coastal and marine spatial planning efforts than opposed them, although support was higher, and opposition or neutrality lower, for CNMI residents.

**Figure 14. Distribution of attitudes toward coastal and marine spatial planning**

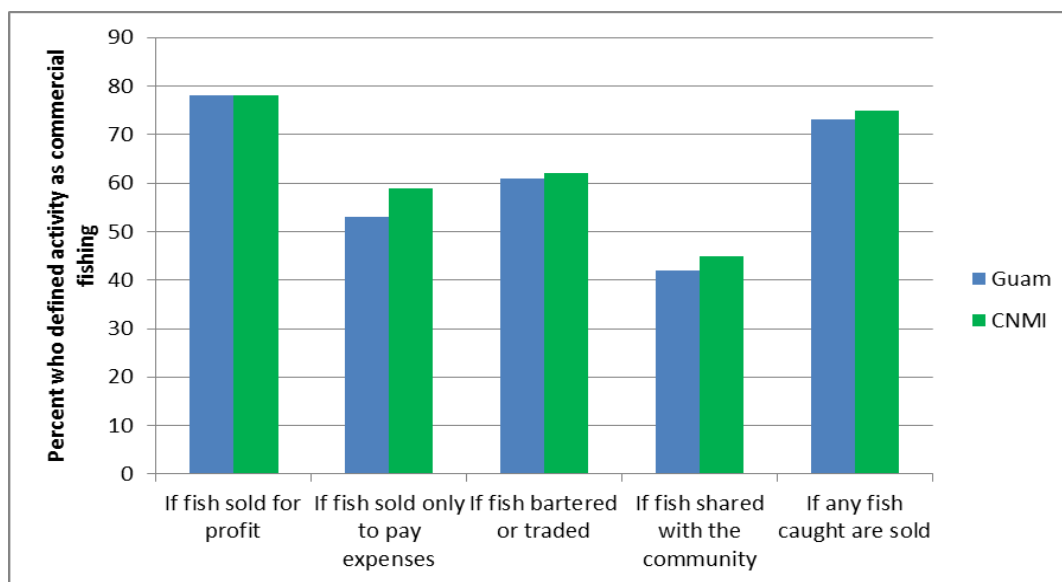


🌀 In Guam, respondents from fishing households were more likely to strongly support coastal and marine spatial planning (36%) than were respondents from non-fishing households (24%). A similar relationship was not found in CNMI.

### *How do people define commercial fishing?*

Commercial fishing is prohibited in the Islands Unit, so we were interested in how residents of CNMI and Guam define commercial fishing. Guam and CNMI residents had similar perceptions of what constituted commercial fishing, with the highest proportion saying that it's a commercial fishing trip if the fish are sold for profit or if any fish caught on the trip are sold. A lower proportion, but still a majority, said that bartering or trading fish, or selling fish to pay expenses, would constitute a commercial fishing trip. In both Guam and CNMI, a majority felt that sharing fish with the community would not mean the trip was a commercial one.

**Figure 15. Distribution of respondents who defined activity as commercial fishing**



🔄 Fishing and non-fishing household respondents tended to have the same definitions of what constituted commercial fishing, except that more CNMI fishing household respondents viewed trading or bartering fish, and selling any fish caught on the trip, as a commercial activity than did respondents from non-fishing households—although a majority of both types of households did define these activities as commercial.

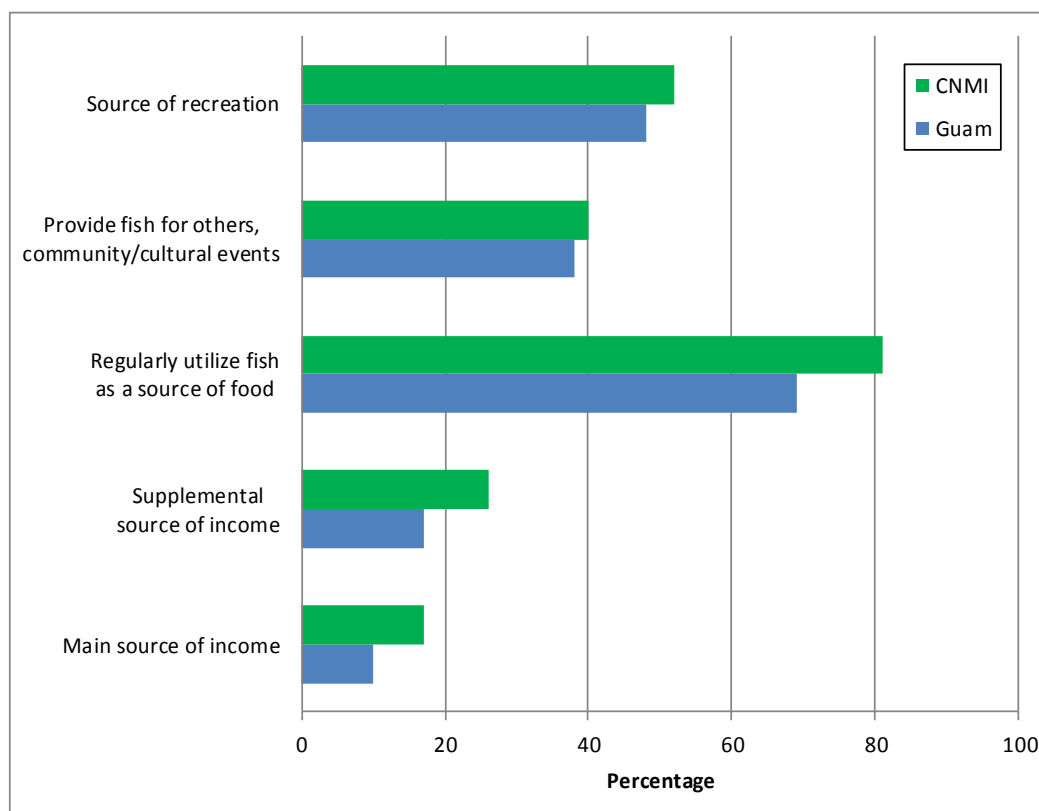
Small boat fishermen surveyed in a separate study (Hospital and Beavers, 2012; 2014) were asked how they would define a fisherman as commercial. The questions were asked somewhat differently than in the Monument survey, but the results can still be compared. Just 5% of the Guam fishermen and 3% of those from CNMI said that selling even one fish would make someone a commercial fisherman. Fishermen from both areas agreed that selling fish for profit (where sales would contribute to personal income) would make someone a commercial fisherman, but the proportion of income derived from fishing had an effect; the highest proportion of fishermen reported that a fisherman would be commercial if all of their personal income came from fishing, while a lower proportion of respondents said a fisherman would be commercial if half of their income came from fishing, and an even lower proportion said a fisherman would be commercial if one-quarter of his income came from fishing. Relatively small percentages of the fishermen defined themselves as part-time or full-time commercial fishermen, while higher percentages described themselves as cultural, subsistence, recreational expense, or purely recreational fishermen, and high proportions also reported having multiple motivations for fishing.

## Characteristics of Fishing Households

Thirty-five percent of the Guam sample and 37% of the CNMI sample said they or someone else in their household was a fisherman. In households with fishermen, 33% of the households contained one fisherman, 24% had two, 17% had three, 9% had four, and 12% had five to eight fishermen in the household. Four respondents from Guam (4%) and three from CNMI (4%) reported having 10 or more fishermen in their household.

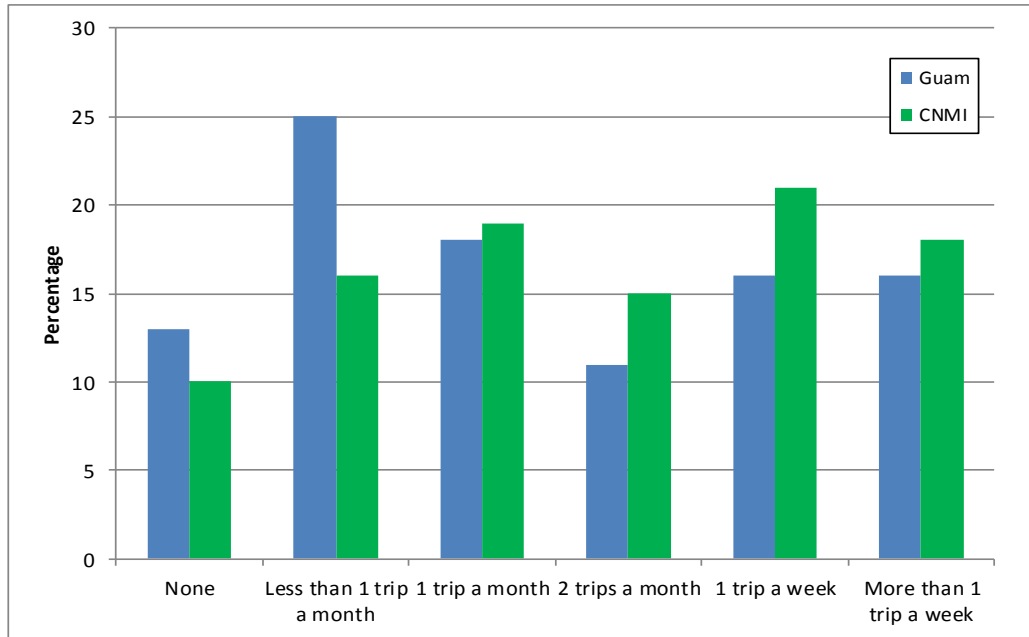
To learn more about the characteristics of fishing households, several supplemental questions were asked of respondents reporting that they live in a household where one or more member is a fisherman. Respondents in fishing households were asked how their household utilizes fish. Fishing was reported as a main or supplemental income source in a higher proportion of CNMI fishing households than in Guam fishing households. Fish also was described as a regular source of food in a greater number of CNMI households than Guam households, although it was important to a sizeable majority in both. Providing fish for others or for community and cultural events was roughly equal in importance to both Guam and CNMI fishing households, as was fishing for recreation.

**Figure 16. Distribution of orientation to fishing (only for fishing households)**



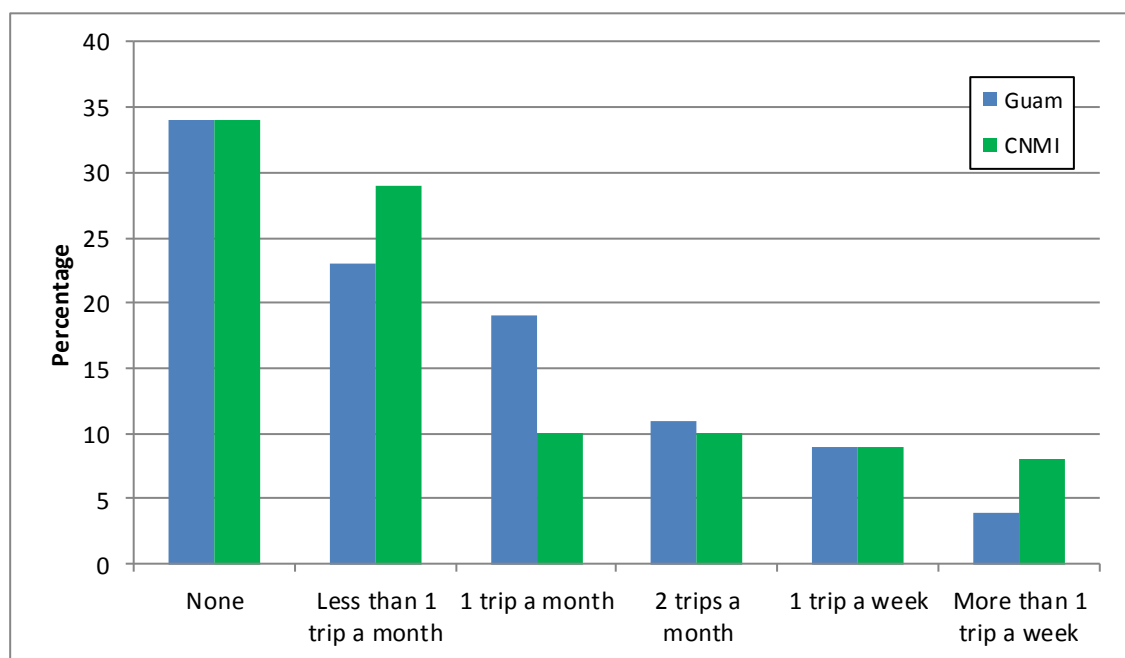
When asked about how many times a fisherman from the household fished from shore over the past 12 months, respondents from CNMI reported fishing from shore more frequently (54% taking two or more trips a month) than did respondents from Guam (43% taking two or more trips a month).

**Figure 17. Frequency of shoreline fishing trips (for fishing households)**



As would be expected given the greater costs associated with boat-based trips, as well as the need to own or have access to a boat, Guam and CNMI fishing households reported taking fewer boat-based trips than shoreline trips. When asked about how many times a fisherman from the household fished by boat over the past 12 months, respondents from CNMI reported fishing from boats with slightly higher frequency (27% taking two or more trips a month) than respondents from Guam (24% taking two or more trips a month).

**Figure 18. Frequency of boat-based fishing trips (for fishing households)**



A recent study of small boat fishermen in Guam and CNMI asked fishermen about their motivations and characteristics, including number and type of fishing trips taken in the last 12 months, what they did with the fish they caught, and related questions (Hospital and Beavers 2012; 2014). Comparison of the frequency of boat-based trips suggests that the fishermen in our sample fished less frequently than the fishermen in the small boat study, although the categories used were different in each study.

In the small boat study, 43% of the Guam fishermen and 32% of the CNMI fishermen reported having given away fish or provided fish for fiestas or community events, comparable to the proportions found in our study. About 80% of our fishing household respondents on Guam and 70% on CNMI said they regularly use fish as a food source; this was very consistent with the proportion of fishermen in the small boat survey who said that fish they catch are an important source of food for their families.

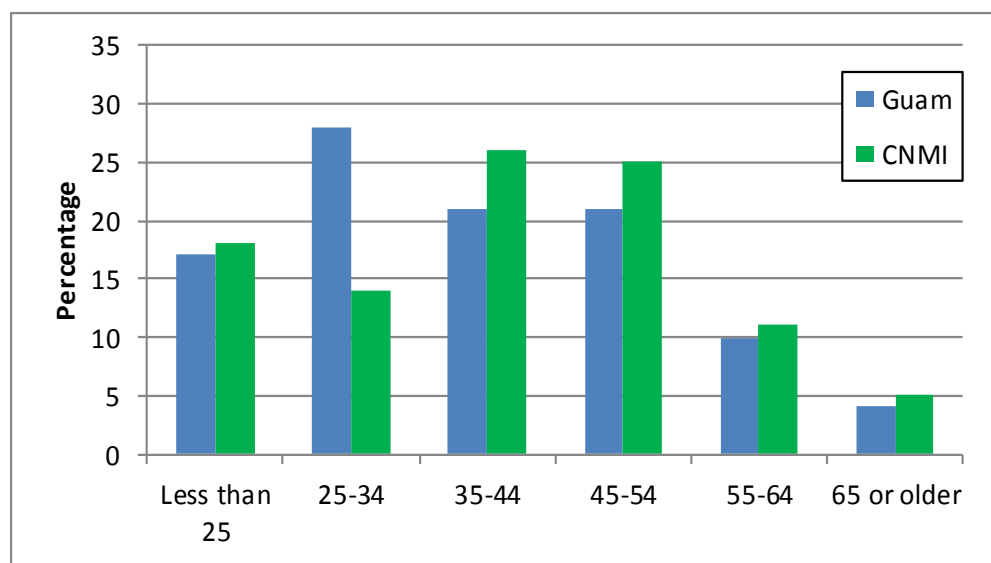
Finally, Guam respondents from fishing households were asked whether someone in their household was a member of the Guam Fishermen's Cooperative Association; or if they had purchased fish at the Coop store. Ten percent reported that someone in their household was a member, while nearly half (48%) reported having bought fish at the Coop. This question was asked only to fishing households, so we do not know the percent of the non-fishing households that purchased fish at the Coop.

## Demographic Characteristics of Survey Respondents

In addition to the topic-oriented survey questions, the randomly-selected survey respondents were asked several questions related to their age, educational background, employment, household income, and other demographic characteristics.

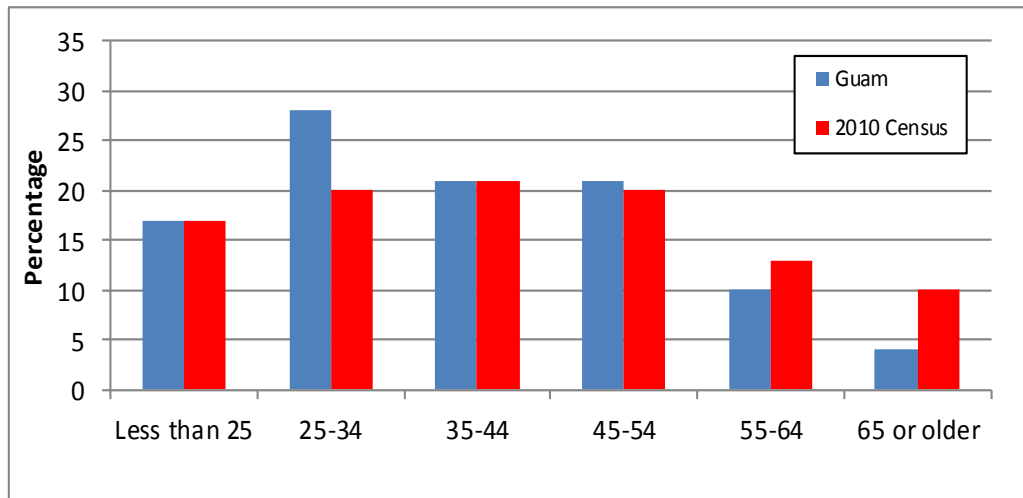
Fifty-seven percent of the Guam residents interviewed were male (compared to 51% over age 20 in the 2010 Census), compared to 56% of the CNMI residents (51% over age 20 in the 2010 Census; US Census Bureau 2011). Guam respondents tended to be younger and have slightly lower levels of education than those in the CNMI, although the patterns were similar across jurisdictions.

**Figure 19. Age distribution of survey respondents from CNMI and Guam**

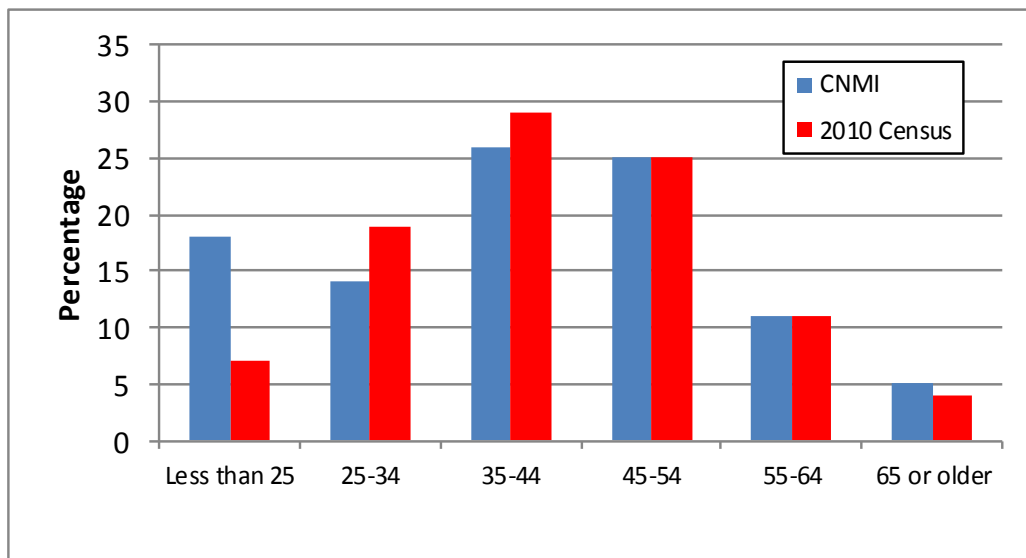


To see how closely our sample resembled the population of Guam and CNMI, we made several comparisons between our sample demographics and population demographics as measured by the 2010 Census. For Guam, our sample was quite similar to the population except we had a higher proportion of respondents age 25-34 and lower proportions of respondents in the two highest age groups. For CNMI, the age distribution of survey respondents also resembled population characteristics except the sample included a higher proportion of younger residents age 25 or less.

**Figure 20. Age distribution of survey respondents and 2010 Census in Guam**



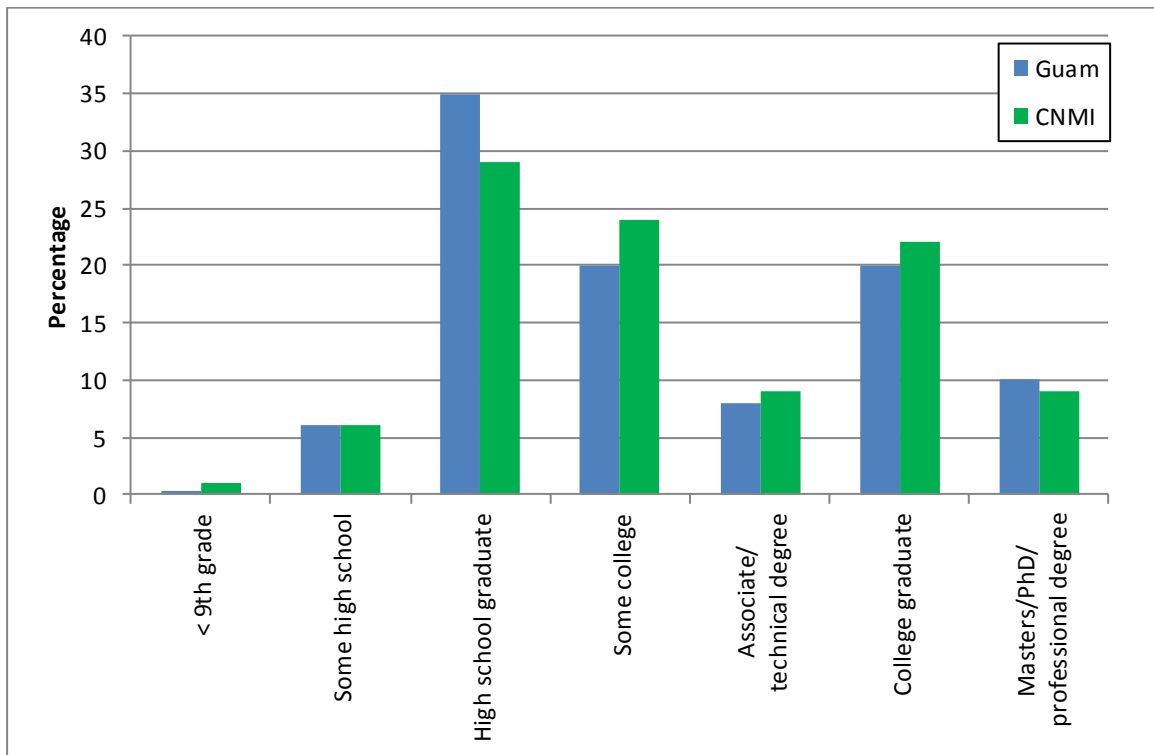
**Figure 21. Age distribution of survey respondents and 2010 Census in CNMI**



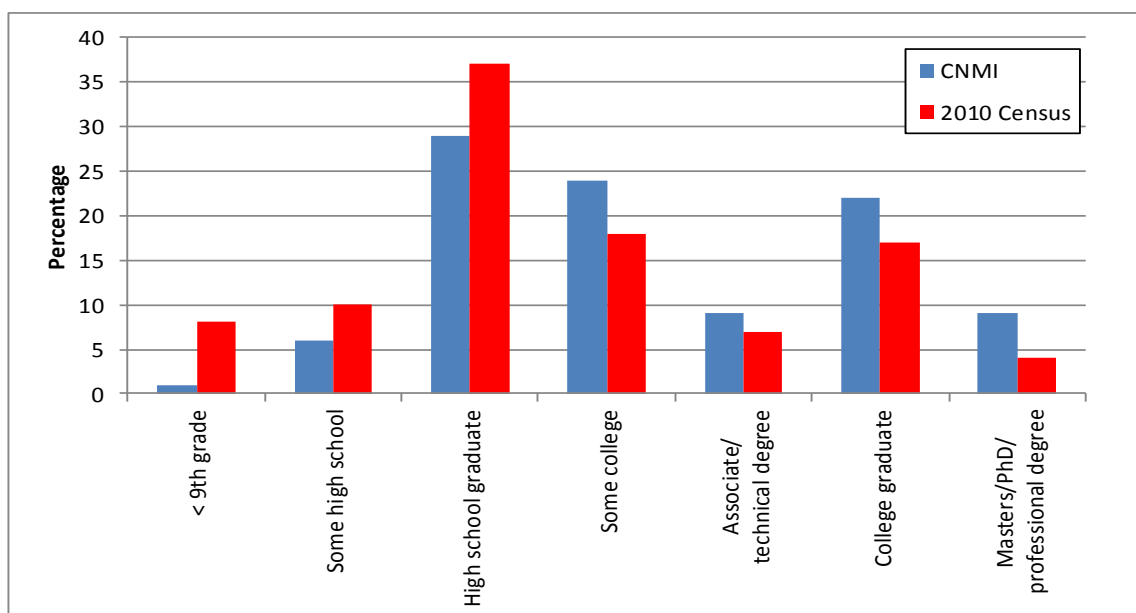


The education patterns in our samples resembled those present in the population as measured by the 2010 Census for both Guam and CNMI with the exception of including lower proportions of respondents at the lowest education levels.

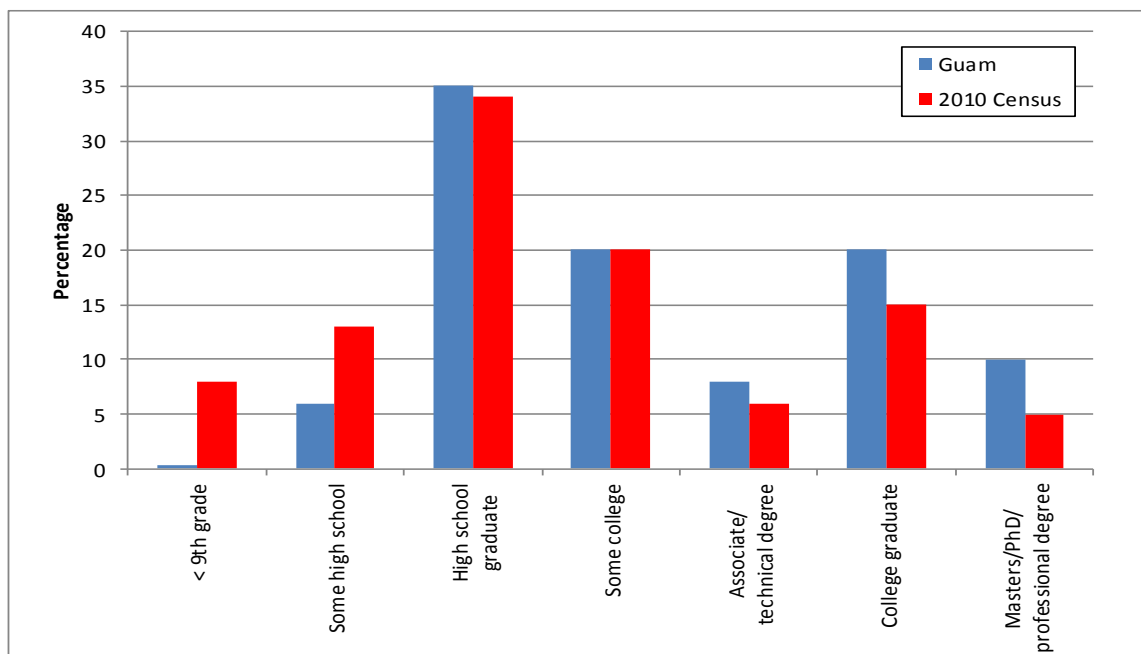
**Figure 22. Distribution of survey respondent level of education in Guam and CNMI**



**Figure 23. Distribution of survey respondent and 2010 Census level of education in CNMI (this chart includes the whole sample, the Census reports education only for over age 25)**

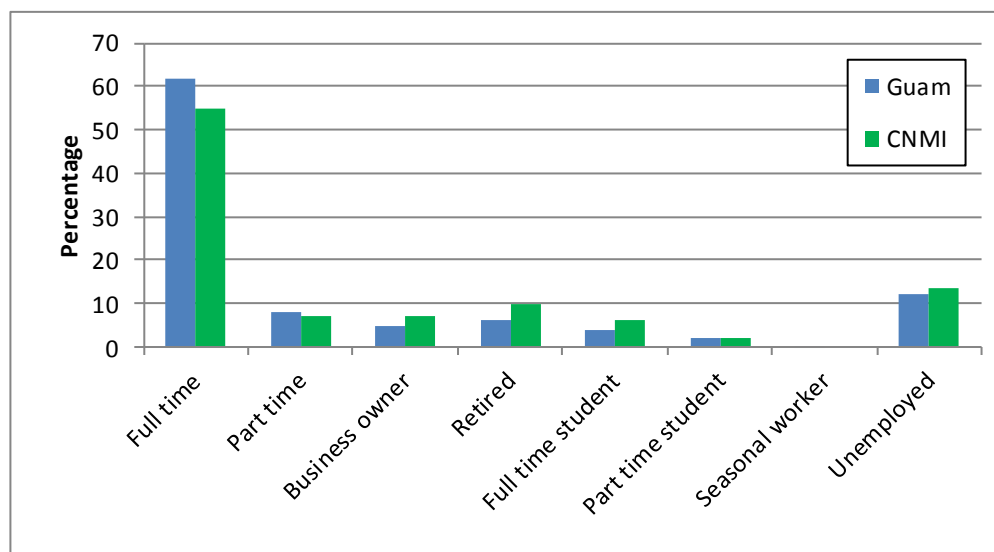


**Figure 24. Distribution of survey respondent and 2010 Census level of education in Guam (this chart includes the whole sample, the Census reports education only for over age 25)**



Several questions were asked about employment status and income.

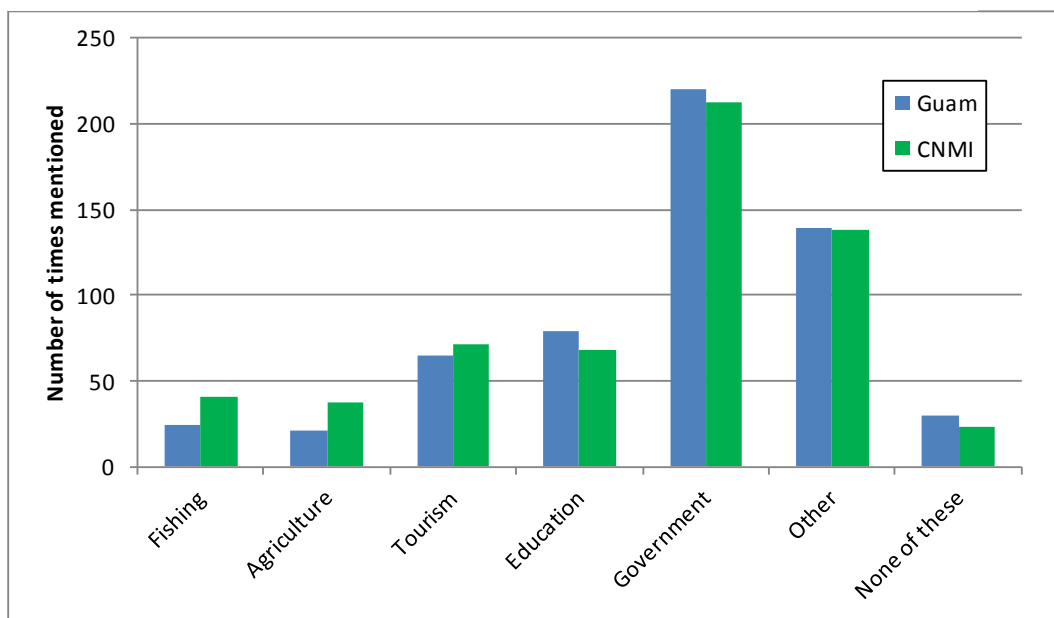
**Figure 25. Distribution of survey respondent employment status in Guam and CNMI**



A majority of respondents from both Guam (62%) and CNMI (55%) reported that they were employed full-time. The next most commonly reported employment status in both jurisdictions was 'unemployed' with 12% of respondents from Guam and 14% of respondents from CNMI.

Respondents were asked whether income in their household was provided by fishing, tourism, agriculture, education, government, and/or other activities; they could chose more than one category. Government dominated as a source of income in both jurisdictions. Greater numbers of CNMI than Guam households reported economic contributions from fishing and agriculture.

**Figure 26. Number of times sector identified as contributing to household income by survey respondents in Guam and CNMI**



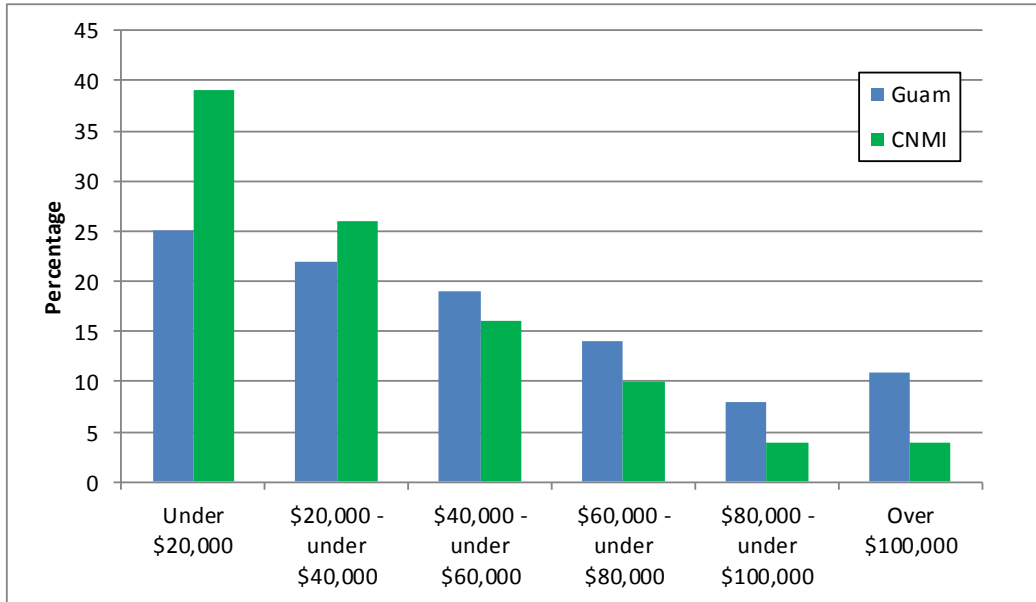
Of the “other” activities, the most commonly listed by Guam residents were private sector or company (26 households), construction (11 households), self-employed (5), and sales (3); other responses listed by a single individual included tug boat captain, deep sea diver, doctor, pastor, and taxi driver. Those “other “ activities most commonly listed by CNMI residents were private sector or company (53 households), construction (7), and health care (5); ; other responses listed by a single individual included music composer, pharmacy technician, powerhouse maintenance, marine surveying, and “I can’t say.”

When asked about their level of household income, it was not surprising that Guam residents reported higher income levels than CNMI residents, consistent with the poorer fiscal conditions in CNMI (Allen and Amesbury 2012).

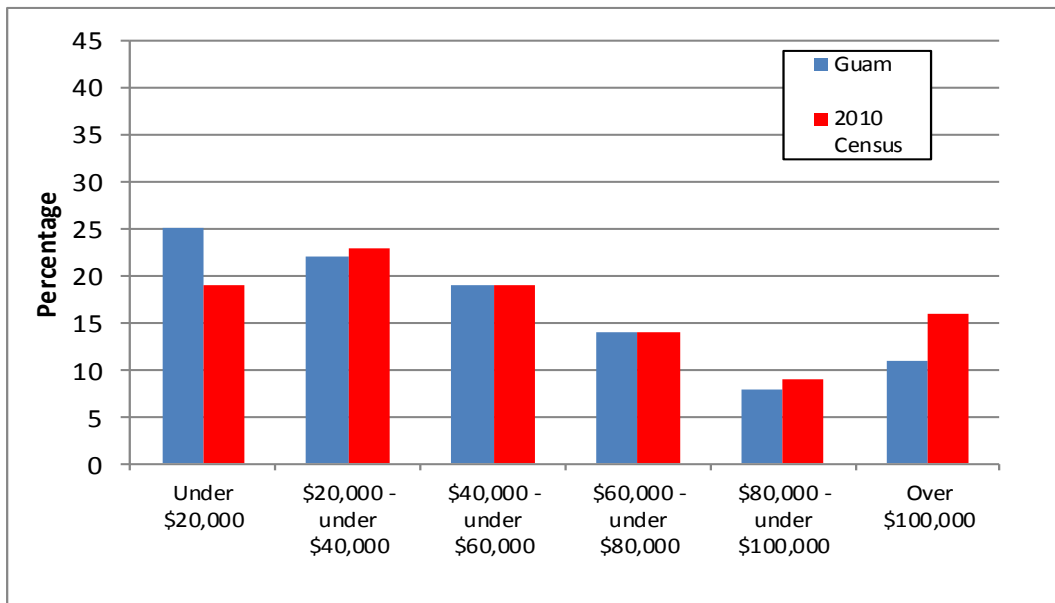
The income of our respondents' households closely matched those in the population as a whole, although the Guam sample had a slightly higher proportion of households in the lowest income bracket and a slightly lower proportion in the highest income category.

*Note: The Census uses different categories to report income for the CNMI population—the Census categories are under \$15,000, \$15,000-\$30,000, \$30,000-\$50,000, \$50,000-\$75,000, \$75,000-\$100,000 and over \$100,000.*

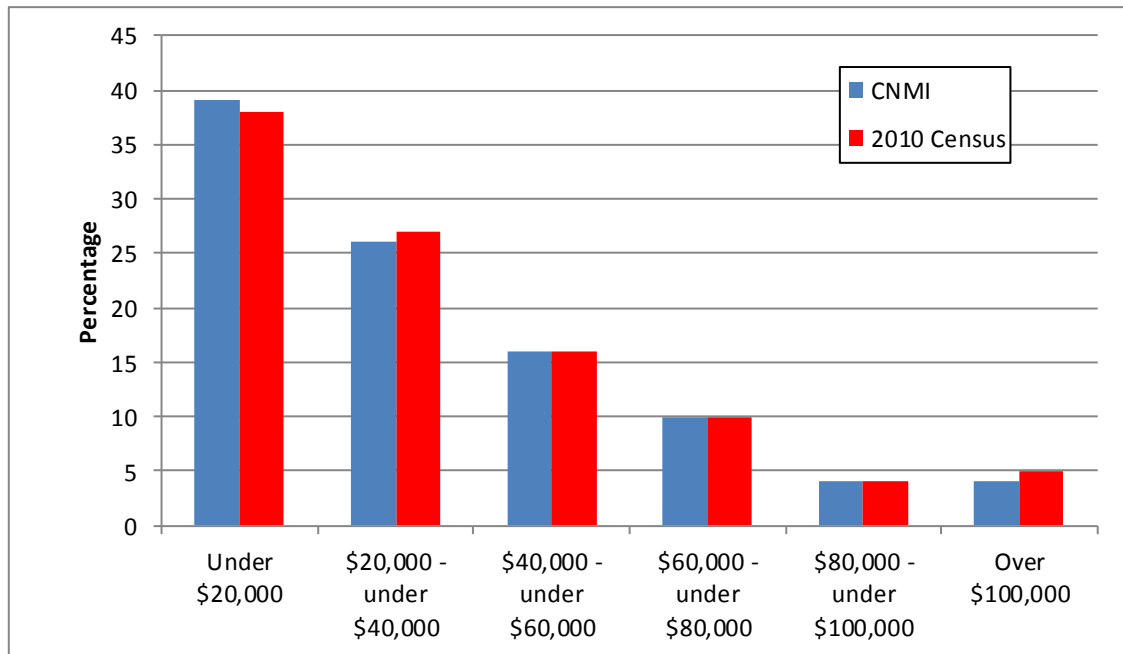
**Figure 27. Distribution of survey respondent income level in Guam and CNMI**



**Figure 28. Distribution of survey respondent and 2010 Census income levels in Guam**

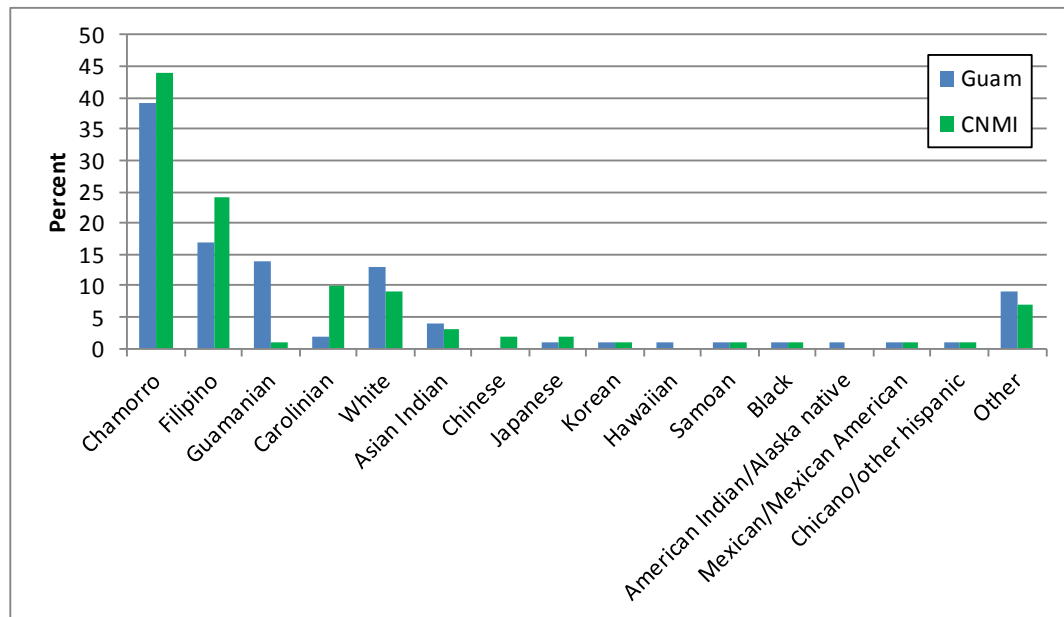


**Figure 29. Distribution of survey respondent and 2010 Census income levels in CNMI**



When asked to describe their ethnicity in an open-ended format, the largest proportion of both Guam and CNMI residents reported being Chamorro, followed by Filipino in both, followed by Guamanian for Guam residents and Carolinian for CNMI residents. Nineteen (3.9%) respondents from Guam and 22 (4.3%) from CNMI reported being more than one race.

**Figure 30. Distribution of survey respondent ethnicity in Guam and CNMI**



Guam respondents had lived on Guam an average of 30 years, while CNMI residents had lived an average of 26 years in the CNMI. The mean household size was 4.9 people (median = 4).

## **Limitations of the Study**

Interpretation of the results of this study should be conducted with knowledge of its limitations. All estimates provided above are within +/- 4.2% of population values at the 95% confidence level.

The study was conducted by phone, imparting has an inherent bias toward residents with phones and those who are willing to answer surveys on them. This is likely to result in oversampling individuals and households of higher economic status since some lower income households may not have a home (landline) phone or mobile phone. The survey was administered using random digit dialing with one fifth of the interviews initiated by cell phones and four-fifths of the surveys conducted on landline phones. Younger and or recently relocated residents may only use cell phones and not landlines which could bias the sample toward older residents and away from those who have recently moved.

Some of the survey questions were designed to address specific needs of managers. The purpose of these questions is to assist managers in prioritizing management actions and goals. Responses to these questions will inform Monument managers in regulating activities within the Monument and outreach activities related to the Monument.

Several survey questions have also been designed to evaluate perspectives about specific claims made by proponents of the Monument prior to its establishment. Conservation NGOs suggested certain benefits – especially economic benefits - would be enjoyed by local residents with the designation of the Monument. The purpose of these questions is to assess how residents feel about these claims now that the Monument has been established.

The researchers are aware that residents in CNMI and Guam speak many languages other than English. Interviewers were capable of conducting the survey in English, Tagalog, or Chamorro, the three most commonly spoken languages in CNMI and Guam. The initial contact was conducted in English which may have dissuaded respondents uncomfortable answering the questions in English from requesting the survey to be conducted in another language. An additional 126 other respondents were contacted who did not speak one of the languages offered; including people speaking Korean, Vietnamese, and Chinese. The preference for conducting the survey in one of the most three commonly spoken languages provides an additional bias in the sample.

## **Conclusions**

This research was designed to provide Monument managers with information about how the Monument and related management issues are perceived by residents of Guam and the CNMI. This should help the managers to develop the Management Plan, design outreach programs, and gauge citizens' future levels of involvement in Monument activities. It would be valuable to conduct another population survey in 3-5 years, to obtain perceptions once there was greater awareness of the Monument and a greater likelihood that associated activities begin to have an effect in the community. The results also should be of interest to the Pacific Islands Fisheries Science Center as it develops a science plan for the Monument. Many of the results regarding local issues such as marine protected

areas should be of interest to Guam and CNMI agencies. The findings can also provide a basis for future research with the region's fishing and non-fishing population, whether or not the focus is the Monument. An attempt was made to present the findings in a format conducive to the utilization and application of the results and if this approach proves useful, it will be followed in the future.

## **Acknowledgements**

This research could not have been accomplished without the assistance of many individuals. We would like to thank the residents of CNMI and Guam who participated in this study for their participation and for sharing their insights. We thank American Directions Group for implementing the survey, and Washington Analytics, especially Harley Heimovitz who managed the survey throughout its administration. We thank the Pacific Islands Regional Office for providing funding and their contribution of Monument managers' interests in survey results. We appreciate the input of many residents and natural resource managers in Guam and CNMI, especially Valerie Brown, John Gourley, Evangeline Lujan, Steve McKagan, and Arnold Palacios, on versions of the survey.

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## Appendix A. Survey Methods

Under the Paperwork Reduction Act, surveys need to obtain approval by the Office of Management and Budget before they can be conducted; approval was obtained 12/13/2011. Following an open solicitation process, HDRP hired an established polling firm, American Directions Group, Inc., located in Lakeland, Florida to conduct the telephone survey and the survey was conducted in January and February, 2012. The following section describes survey procedures. The sample design included 1,000 respondents selected using random digit dialing (RDD) phone interviews. Half of the respondents were residents of Guam and the other half from CNMI. In addition, 200 of the 1,000 interviews were initiated as cell phone calls to include residents who were more likely to be reached by cell phone<sup>4</sup>. RDD and CATI methodology were used for conducting both landline and cell phone interviews.

**Table 9. Sampling and call mode of CNMI monument survey**

<b>Location</b>	<b>Call Mode</b>		
	<b>Total</b>	<b>Landline</b>	<b>Cell Phone</b>
Guam	500	400	100
CNMI	500	400	100
<b>Total</b>	1,000	800	200

### Survey Precision

Precision of the sample estimates was dependent partly on underlying variability in population characteristics and partly on sample size, which in turn was dictated by sampling costs and the desired margin of error. The result of these considerations is that all estimates provided from the survey are within +/- 4.2% of population values at the 95% confidence level. For example, if 52% of the respondents reported a particular attitude toward the Monument, then we can be 95% confident that between 47.8% and 56.2% of the entire population has the same attitude.

Standard error calculations assumed that 80% of sample respondents were accessible by landline-only or landline-mostly, and the remainder were accessible by cell phone-only or mostly. The 80/20 proportions were derived from estimates, and reflect the changing telephone habits of Americans; proportions for Guam and CNMI residents may vary (Link et al 2009).

### Pretest Interviews

Prior to our receipt of OMB approval for the survey, we interviewed 9 Guam/CNMI respondents were interviewed during a pretest. Some of the pretest respondents were known to the interviewers but received no prior information about the survey. The pretest interviews were audiotaped and the audio and data results were shared and discussed between NMFS and the contractors. Experience in the pretest was used to revise survey questions and interviewer instructions prior to the survey launch.

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<sup>4</sup> Reflecting cell phone-only and –mostly respondents.



## Interviewer Training

Fifty-two interviewers and supervisors were trained to execute the project. All interviewers received a full project briefing, which covered a project overview, purpose of research, target respondents (with a map showing general area of the Monument), privacy laws, Guam/CNMI general population information, and what to expect from respondents. Interviewers were also briefed on the survey, and a formal review of each question was conducted that addressed any potential issues, pronunciations of names and coding of responses. After the briefing, interviewers practiced with the CATI software program to get familiarized with the survey. Interviewers with other language capabilities, specifically Chamorro and Tagalog, were available but no respondents requested the survey be conducted in another language.

## Sampling Frame for RDD Calls

The sample was derived using random digit dialing (RDD) across all exchanges and phone numbers for Guam and CNMI country codes/prefixes. As a sampling frame for the survey, we began by using published exchange rate centers for Guam (area code 671) and CNMI (area code 670). Next, we excluded from the RDD sampling frame all Guam exchanges that were known to be (published) unavailable/reserved or were used at the Naval or Andersen Air Force Bases. Finally, published landline and cell phone exchanges were segregated.

## Response Rate and Data Collection Statistics

One problem with the RDD approach is that potentially a large number of business, institutional, and other, non-residential phone numbers are contacted, as well as non-working, disconnected residential phone numbers. This issue affects the sampling outcome rates. These extraneous phone numbers were taken into account in the sample disposition results so that the total sampling universe reflects the number of households in Guam and CNMI. The sampling outcome rates are shown below:

**Table 10. Sampling outcome distribution rates of response**

<b>Sampling Outcome<sup>5</sup></b>	<b>Percent</b>
Response Rate	38
Cooperation Rate	50
Refusal Rate	42
Contact Rate	90

The pool of potential interviewees was equal to the contact rate of 90%. The response rate was lower and refusal rate somewhat higher than hoped but reasonable for a RDD phone interview.

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<sup>5</sup> In general terms, Response Rate refers to the number of completed surveys divided by the number of attempted interviews and unknown contact outcomes; Cooperation Rate is similar to Response Rate but excludes unknown contact outcomes from the denominator, thereby increasing the value of the rate; Refusal Rate is the ratio of refusals to attempted interviews, including unknown contact outcomes; Contact Rate is the ratio of completed, partial, and refused interviews to the number of attempted interviews (excluding unknown outcomes). For technical definitions, see [http://www.aapor.org/Response\\_Rates\\_An\\_Overview1.htm](http://www.aapor.org/Response_Rates_An_Overview1.htm).

## **Data Collection Timing and Logistics**

Each day, from 5 to 15 interviewers called Guam/CNMI phone numbers from 5pm ChST to 9pm ChST (weekdays) and 10am to 6pm ChST (weekends). The average interview length was about 25 minutes. Interviewing was conducted from January 9 through February 12, 2012.

Interviews were conducted in English when possible. As needed, translation services were provided for respondents speaking Chamorro and Tagalog, the most prevalent non-English languages in Guam and CNMI. Other Asian-speaking respondents (126, after sample adjustment) were encountered, including those speaking Korean, Vietnamese, and Chinese. When possible, an English-speaker in these households was interviewed; otherwise, the interview was not conducted. While this suggests a slight bias due to these dropped respondents, it was not possible to provide non-English coverage for languages beyond Chamorro and Tagalog. It's likely that local and NOAA information about the CNMI Monument, including television, radio, and print messages, was not translated into those languages. So respondents dropped due to a language barrier may have been somewhat less informed about the Monument, indigenous fishing, and other local cultural issues.

## **Quality Control and Monitoring**

Supervisors monitored the survey and ensured quality control by listening to selected interviewers at work and holding regular discussions with the interviewers about problems and issues that could impact data quality, respondent refusal rates and the length of time for interviews. Data were reviewed after completion of 25, 100, 250 interviews and after the final dataset of 1000 interviews was compiled. The purpose of the data monitoring was to fine tune the interviewer-respondent dialog and ensure accurate and complete data were collected. During the early stages of data collection, some questions were deleted, wording changes were made to the survey instrument, and interviewers were provided new alternatives to handle unexpected problems. During the early data collection stage, the data review process examined distributions of responses to ensure that questions were answered and not ignored, and that the distributions of responses were reasonable.

## **References**

Link, M., G. Daily, C. Shuttles, H. Bourquin, and L. Yancey. 2009. Addressing the cell phone-only problem: cell phone sampling versus address based sampling. *Survey Practice*, February 2009:

## Appendix B. Questionnaire

OMB Control No. 0648-0640  
Expiration Date: 12/31/2014

### Survey Marianas Trench Marine National Monument

#### Introduction:

Hello, my name is \_\_\_\_\_. I'm calling on behalf of the National Marine Fisheries Service. We want to ask you some questions about the Marianas Trench Marine National Monument and your use and opinions about marine resources in Guam/CNMI. First, are you at least 18 years old?

IF NO, ask: Is there another person in the household who is at least 18 years old?

IF NOT AVAILABLE, say: Thank you. Can you please tell me when I can call back to speak to an adult in your household (or you)? (set appointment to callback)

[INTERVIEWER AID TO BE READ AS NECESSARY otherwise skip to screener]

We're contacting only a small sample of Guam/CNMI residents. In order for our results to be accurate we'd really like to speak with you even if you don't know much about the Monument. The results will be provided to Monument managers so they can take citizens' views and perspectives into account when developing a management plan for the Monument. Results from the survey will also be shared with other Guam and CNMI residents. Your identity will remain anonymous and your responses will only be used and reported in combination with responses from other residents.

SC2. Do you consider yourself a resident of Guam [pipe in from sample]?

1. Guam
2. CNMI
3. (DO NOT READ) No/Not sure/DK/Refused – TERMINATE

*[NOTE: Pipe in response to SC2 in questions throughout the survey where "Guam vs. CNMI" was mentioned, i.e., Q18, Q19, INTRO to Section C, Q26, Q27, Q33 & Q45]*

#### A. General/Initial Perceptions about the Monument

1. Now, I'd like to ask you some questions about the Marianas Trench Monument. When did you first hear about the Monument?

1. During the discussion before it was designated in 2009
2. After it was designated
3. Never heard of it (or heard about it on this call) (*SKIP TO QUESTION 7*)
4. (DO NOT READ) Someone called me or someone in my household about this survey (quit survey)

2. How much do you know about the Marianas Trench Monument?

1. Quite a bit
2. A moderate amount
3. Little or nothing
9. (DO NOT READ) Don't know/refused

3. Could you please tell me how you learned about the Monument? (Do not read list but prompt if needed) [ALLOW MULTIPLE RESPONSES]

1. Read or heard about it on radio, tv, newspaper
2. Discussed it with friends or family
3. Attended a meeting
4. Friends of the Monument
5. Internet
6. Government official
7. Other (specify)\_\_\_\_\_
9. (DO NOT READ) Don't know/refused

4. When you first heard about the Monument, did you support or oppose the designation of the Monument? IF SUPPORT/OPPOSE, ask: Would you say you STRONGLY SUPPORT/OPPOSE it or not?)

1. Strongly support
2. Support
3. Neither
4. Oppose
5. Strongly Oppose
9. (DO NOT READ) Don't know/refused

5. Did you participate in any of the following activities related to the Monument? (*select all that apply*)

1. Attended a meeting
2. Wrote a letter
3. Joined an advocacy group (*If so, which one*):\_\_\_\_\_
4. Read up about the issue to get more information
5. Discussed it with others
6. Other (specify)\_\_\_\_\_
9. (DO NOT READ) Don't know/refused

6. Do you feel there was an adequate attempt to understand and include the views of Guam and CNMI residents regarding this designation?

1. Yes
2. No
9. (DO NOT READ) Don't Know/refused

7. (READ THIS FOR ALL RESPONDENTS) I'd like to give you some background on the Marianas Trench Marine National Monument was designated in 2009 and is made up of certain areas of the waters and submerged lands of the Northern Mariana Islands chain and the Marianas Trench. Within the Monument, activities such as scientific research, fishing practices and access will be jointly managed by the Federal Government, including NOAA Fisheries and the Fish and Wildlife Service, and representatives from the Guam and CNMI Territorial Governments. The Monument can provide many benefits to the local economy. On a scale of 1 to 5, where 1 is definitely will not occur and 5 is definitely will occur, can you please tell me your opinion about

how likely it is that the following benefits will occur? (Read response options after first item and then again as needed)

[rotate choices]

- i. More media coverage
- ii. Increased tourism due to interest in the Monument
- iii. Increased tourism even if tourists cannot visit the Monument
- iv. Increased visits by research scientists
- v. 400 more local jobs
- vi. Economic benefits of \$10 million annually
- vii. Establishment of a visitor center on Saipan [S-EYE-pan]

*(Response options)*

- 1. Will definitely not occur
- 2. Probably not occur
- 3. Might or might not occur
- 4. Probably occur
- 5. Will definitely occur
- 9. (DO NOT READ) Not sure

8. Do you feel that the Monument will improve protection of marine resources in waters around the Marianas?

- 1. Yes (Will improve protection)
- 2. No (Will not improve protection)
- 3. (DO NOT READ) Don't know

9. Do you believe that the Monument will affect you and your household? *(If 5 or 9, skip to Q12)*

- 1. Definitely
- 2. Probably
- 3. Maybe
- 4. Probably not
- 5. Definitely not
- 9. (DO NOT READ) Don't know

10. What type of effect do you expect this to be?

- 1. Strongly negative
- 2. Negative
- 3. Positive
- 4. Strongly positive
- 5. Some negative, some positive
- 9. (DO NOT READ) Not sure

11. Could you tell me more about how you think the Monument will affect you and your household? [OPEN-END]

## **B. Monument Management and Personal Involvement**

The Monument includes three units; the “Islands Unit” which includes the waters and submerged lands of the three northernmost Mariana Islands (Uracas [er-ROCK-us], Maug [MAAG] and Asuncion [ah-SOON-see-own]), the “Volcanic Unit”, which includes the submerged lands of 21 designated volcanic sites, and the “Trench Unit”, which includes the submerged lands of the Mariana Trench.

12. Your input will be used to develop a management plan that allows for different activities within the Monument. On a scale of 1 to 5, 1 being strongly oppose and 5 being strongly support, what is your level of support or opposition to each of these activities?

[rotate choices]

- i. Charter/private boat recreational fishing
- ii. Being able to fish for food while in the Monument
- iii. Traditional indigenous fishing
- iv. Tourism
- v. Scientific research
- vi. Cultural and religious uses other than fishing
- vii. Monitoring and enforcement
- viii. Military activities

- 1. Strongly oppose
- 2. Oppose
- 3. Neutral
- 4. Support
- 5. Strongly Support
- 9. (DO NOT READ) Don't know

13. Commercial and all other fishing is allowed to continue in the Trench and Volcanic units, but commercial fishing is prohibited in the Islands Unit. Which of the following do you consider to be a commercial fishing trip? (Please answer yes or no for each of the following)

- i. If fish caught on the trip are shared with the community
- ii. If fish caught on the trip are bartered or traded
- iii. If fish caught on the trip are sold only to help pay for trip expenses
- iv. If fish caught on the trip are sold for profit
- v. If any fish caught on the trip are sold

- 1. Yes
- 2. No
- 9. (DO NOT READ) Don't know

14. In your opinion based on recent fishing activity, what portion of fish caught in the Islands Unit of the Monument (the three northernmost islands), was landed in the CNMI?

- 1. None
- 2. Very little

- 3. About 25%
- 4. About half
- 5. About 75%
- 6. Nearly all
- 9. (DO NOT READ) Don't know

15. Permits may be required for some types of public use activities within the Monument. In your opinion, should the permit process be more restrictive to err on the side of resource protection, or less restrictive, to err on the side of resource use?

- 1. More restrictive
- 2. Less restrictive
- 9. (DO NOT READ) Don't know

16. As described earlier, activities within the Monument such as scientific research, fishing practices and access will be jointly managed by the Federal Government, including NOAA Fisheries and the Fish and Wildlife Service, and representatives from the Guam and CNMI Territorial Governments. On a scale of 1 to 4, 1 being no confidence and 4 being a high level of confidence, for each of the following statements, could you tell me your level of confidence regarding their ability to manage the Monument?

[rotate topics]

- i. Government of Guam
- ii. Government of CNMI
- iii. Military/Department of Defense
- iv. Federal Agencies including NOAA Fisheries Service and the Fish and Wildlife Service
- v. Monument Advisory Council with Federal and CNMI members

- 1. No confidence
- 2. Low confidence
- 3. Moderate confidence
- 4. High confidence
- 9. (DO NOT READ) Not sure

17. Establishing the Monument will provide opportunities for scientific research and study of the unique ecosystem components. The following are research topics that are of interest for scientists within the Monument. On a scale of 1 to 5, where 1 is very disinterested and 5 is very interested. Please rate your level of interest for research on each of these activities:

[rotate topics]

- i. Climate change impacts
- ii. Invasive species
- iii. Protected species
- iv. ~~Habitat for marine species~~ (dropped after pilot test)
- v. Deep water exploration
- vi. ~~Weather monitoring~~ (dropped after pilot test)
- vii. Coral reef diversity
- viii. Fish populations

- ix. Cultural studies
- x. Economic studies

- 1. Very disinterested
- 2. Somewhat disinterested
- 3. Neutral
- 4. Somewhat interested
- 5. Very interested
- 9. (DO NOT READ) Not sure

*For subsequent sections, if SC2 = 1 or 3 use Guam, if SC2 = 2 use CNMI*

18. Do you believe that scientists should make an effort to present the results of their work locally (in CNMI/Guam)?

- 1. Yes
- 2. No
- 3. (DO NOT READ) Don't know or care

19. How do you feel about using Monument science results to increase marine education in Guam/CNMI schools? On a scale of 1 to 5, 1 being strongly oppose to 5 being strongly support.

- 1. Strongly oppose
- 2. Oppose
- 3. Neither
- 4. Support
- 5. Strongly support
- 9. (DO NOT READ) Refused/Don't know or care

20. Would you like to be updated on the status of Monument management issues as the management plan is being developed?

- 1. Yes
- 2. No
- 3. (DO NOT READ) Don't know

21. What are the best ways to provide you and your household with more details about ongoing Monument activities? (select all that apply)

- 1. Public meeting or forum
- 2. Public school system
- 3. Newsletter
- 4. Facebook, Blog or website
- 5. Articles in newspaper
- 6. Radio/Television announcements
- 7. Other \_\_\_\_\_
- 8. (DO NOT READ) Don't know/refused

22. On a scale of 1 to 5, 1 being not at all likely to 5 being very likely, how likely or unlikely would it be for you or members of your household to:



- i. Attend presentations of scientists' results of studies in the Monument
- ii. Attend public meetings related to creating the management plan for the Monument
- iii. Volunteer to help visiting scientists with science education for local students, researchers and educators
- ~~iv. Volunteer to help inspect ship hulls for invasive species (dropped after pilot test)~~
- v. Visit center on Guam/Saipan [*pipe in "Guam" /"Saipan" depending on SC2*]

i

- 1. Not at all likely
- 2. Not likely
- 3. Neutral/not sure
- 4. Likely
- 5. Very likely
- 9. (DO NOT READ) Refused

23. Are there any other ways you or members of your household would like to be involved in Monument activities? [IF YES, ask: What activity is that? And in what way would you or your family like to be involved?] [OPEN-END]

24. (*If Q1 = 3*):

Given the information you know so far, how do you currently feel about the Monument?

OR

(*If Q1 = 1 or 2*):

Now, 2 years after designation, how do you currently feel about the Monument?

(*for both versions of the question*) On a scale of 1 to 5, 1 being strongly oppose to 5 being strongly support.

- 1. Strongly oppose
- 2. Oppose
- 3. Neither
- 4. Support
- 5. Strongly Support
- 9. (DO NOT READ) Don't know/Refused

**C. The next few questions are not about the Monument, but how you feel about existing reef and ocean conditions around Guam/CNMI and how they are managed.**

25. How would you rate the condition of reef waters and fish populations around Guam/CNMI?

(Read answer choices)

- 1. Excellent
- 2. Good
- 3. Neutral
- 4. Poor
- 5. Terrible
- 9. (DO NOT READ) Not sure

26. How would you rate the condition of farther offshore, open ocean waters and fish populations around Guam/CNMI? (Read answer choices.)

1. Excellent
2. Good
3. Neutral
4. Poor
5. Terrible
9. (DO NOT READ) Not sure

27. We're also interested in your opinion about the nearshore marine protected areas or marine reserves around Guam/CNMI. How familiar are you with these areas?

1. Very familiar
2. Somewhat familiar
3. Not at all familiar

28. Did any of your uses of the coasts and waters change when the nearshore marine protected areas were designated? (*If no, skip to Q30*)

1. Yes
2. No

29. How were they changed?

30. The following are statements people have made about the effects or conditions of nearshore marine protected areas. On a scale of 1 to 5, where 1 is strongly disagree and 5 is strongly agree, could you please tell us your opinion of whether...

[rotate statements]

- i. They increase the number of fish **INSIDE** the preserve
- ii. They are not needed to protect habitats and marine resources
- iii. They increase the number of fish **OUTSIDE** the preserve
- iv. They protect cultural resources
- v. They provide educational opportunities
- vi. They reduce access to traditional fishing
- vii. They do not provide benefits to the local economy
- viii. They are well enforced

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree
9. (DO NOT READ) Don't know/Refused

31. Do you believe that there is currently conflict over uses of the ocean and coast around Guam/CNMI? [IF YES, ask: And, do you think there is lots of conflict, a moderate amount or just a little conflict?]

1. Lots of conflict
2. Moderate conflict
3. Little conflict

4. No conflict

32. One way of dealing with conflicting uses of the ocean and coast is to designate zones for one or more uses. Marine National Monuments and nearshore marine protected areas do this but so do broader planning efforts. On a scale of 1 to 5, 1 being strongly oppose and 5 being strongly support, what is your opinion of these types of coastal and marine spatial planning efforts?

1. Strongly oppose
2. Oppose
3. Neutral
4. Support
5. Strongly support
9. (DO NOT READ) Don't know

33. Is there anything else you'd like to tell us about the Monument or coastal and marine resources and how they're managed around Guam/CNMI?

**D. Fishing Orientation.** Now we'd like to ask you about some of your own experiences.

34. Have you ever been to or seen in person any of the following northern Mariana Islands: Uracas [er-ROCK-us], Maug [MAAG] or Asuncion [ah-SOON-see-own]?

1. Yes
2. No skip to Q36

35. [IF Q34=1] About when and what did you do there?

36. Do you know anyone else, such as a friend or relative, who has visited these three northern islands?

1. Yes
2. No
3. (DO NOT READ) Don't Know

37. Are you or is someone in your household a fisherman?

1. Yes
2. No

*(If no, skip to DEMOGRAPHICS)*

38. Is this you? If yes, is this only you or you and others in your household?

1. Myself only
2. Other household members only
3. Self and Others

38A. [IF Q38=2 or 3] How many total people in your household are fishermen? [NUMERIC RESPONSE, scale 1 to 20, 99=REFUSED]

39. Approximately how many times did a fisherman in your household fish from shore over the past 12 months? (*choose closest one*)

1. None
2. Less than one trip a month (fewer than 12 trips total)
3. One trip a month (about 12 trips total)
4. Two trips a month (24 trips total)
5. One a week (52 trips total)
6. More than once a week (more than 52 trips a year) estimated #: \_\_\_\_\_

40. Approximately how many fishing trips by boat did a fisherman in your household take over the past 12 months? (*choose closest one*)

1. None
2. Less than one trip a month (fewer than 12 trips total)
3. One trip a month (about 12 trips total)
4. Two trips a month (24 trips total)
5. One a week (52 trips total)
6. More than once a week (more than 52 trips a year) estimated #: \_\_\_\_\_

41. Does your household utilize fish as...? (*Please respond Yes or No to each of the following statements*):

- i. A main source of income
- ii. A supplemental source of income
- iii. A source of food on regular basis
- iv. To provide fish for others, community/cultural events
- v. A source of recreation

1. Yes
2. No
3. (DO NOT READ) Refused

[Only ask 42 and 43 if SC2 = 1]

42. Is someone in your household a member of the GFCA (Guam Fishermen's Cooperative Association)?

1. Yes
2. No

*FOR INFO ON GFCA: <http://www.guamfishermenscoop.com/About-Us.html>*

43. Have you bought fish at the GFCA?

1. Yes
2. No

## **E. Demographics**

Demographics Intro: We have just a few more questions that will be used for statistical purposes.

44. What village do you live in?\_\_\_\_\_

45. How long have you lived on Guam/CNMI?

46. How many people live in your household?  
\_\_\_\_\_people

47. Which of the following activities provides income in your household? (*Check all that apply*)

1. Fishing
2. Agriculture
3. Tourism
4. Education
5. Government work
6. Other (*specify*)\_\_\_\_\_
7. None
9. (DO NOT READ) Don't know/refused

49. How would you describe your race?

(DO NOT READ LIST, ALLOW MULTIPLE RESPONSES. If they respond with Pacific Islander or Hispanic, please ask to be more specific.)

1. Guamanian
2. Filipino
3. Chamorro
4. Carolinian
5. White
6. Chinese
7. Japanese
8. Korean
9. Vietnamese
10. Native Hawaiian
11. Samoan
12. Asian Indian
13. Black/African American
14. American Indian or Alaska Native
15. Mexican/Mexican American
16. Chicano
17. Puerto Rican
18. Cuban
19. Other Hispanic, Latino or Spanish Origin
20. Other (*specify*)\_\_\_\_\_
99. (DO NOT READ) Refused

50. (*Interviewer notes gender if unsure, ask:*) What is your gender?

1. Male
2. Female

51. What is your age?

1. less than 25 years
2. 25 to 34 years
3. 35 to 44 years
4. 45 to 54 years
5. 55 to 64 years
6. more than 64 years
9. (DO NOT READ) Refused

52. What is the highest level of education you have completed?

(READ LIST)

1. Less than 9<sup>th</sup> grade
2. Some high school (no diploma)
3. High school graduate (including GED)
4. Some college (no degree)
5. Associates degree or technical school
6. College graduate (bachelor degree)
7. Masters, Professional, or Doctoral degree
9. (DO NOT READ) Refused

53. Are you currently employed, retired, a business owner, or a student? [IF EMPLOYED/STUDENT, ask: And is that full-time or part-time?]

1. Employed Full-time
2. Employed Part-time
3. Small business owner
4. Retired
5. Student (full-time)
6. Student (part-time)
7. Seasonal and/or day labor
8. Unemployed
9. Other (specify) \_\_\_\_\_
99. (DO NOT READ) Refused

~~54. Do you belong to any community organizations? (original question-replaced by 54A)~~

- ~~1. Yes~~
- ~~2. No~~

54A. How active are you in community organizations?

1. Very active
2. Somewhat active
3. Not at all active

~~55. [IF Q54=1] Which community organizations do you belong to? (original question-replaced by 54A)~~

56. Please tell me which of the following corresponds to your total household income before taxes, in 2010:

1. Less than \$20,000
2. \$20,000 to less than \$40,000
3. \$40,000 to less than \$60,000
4. \$60,000 to less than \$80,000
5. \$80,000 to less than \$100,000
6. \$100,000 or more
9. (DO NOT READ) Refused

Q57. Do you have any other comments or feedback you'd like to offer at this time?

1. No
2. Yes (record verbatim)

Thanks very much for your time. As soon as the results are analyzed, we will make them available in several ways. (If asked, at Monument planning meetings; on the internet; and summaries will be provided to local media outlets).